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Japanese Rubber Industry Suffers

APROPOS of the appalling catastrophe which recently befell the inhabitants of Tokio, Yokohama, and their environs, it might be said that, if grief could be solaced with sympathy and sorrow could be slackened by being widely shared, the compassion so universally expressed and the relief so quickly and so generously offered should be a fountain of consolation to the sorely-afflicted Nipponese.

The rubber industry of Japan is one of the many that has sustained much of the staggering loss of life and property. In the devastated districts were located many of the rubber fabricating concerns of the empire, establishments owned by enterprising natives, Americans and Europeans. Several were comparable in equipment and management with some of the most up-to-date occidental mills, just as the output rivalled in quality and quantity that of many of the oldest western concerns.

What has been particularly gratifying to the leaders of the rubber industry in Europe and America has been the ever increasing eagerness of the Japanese to conform to the high standards set by the better western producers and to regard ethics as an essential in all business dealings. It is because the Japanese rubber men have sought to carry out the best traditions of the trade that American rubber men not only condole with them in the great physical distress caused by earthquake, fire, and tidal wave, but also deplore the widespread dislocation of the industry conducted by the "Yankees of the East."

It is their heartfelt wish that the rubber industry of Japan may soon rise again, phoenix-like from its ashes, may soon regain the high place it so fairly won, and that neither it nor the nation may ever again be distressed with any sort of disaster.

American Planting to the Fore!

MUST Americans pass through the throes of a speculative orgy akin to the rage for "rubbers" or the craze for "kaffirs" which afflicted our British cousins some twenty years ago, and not unlike the great waves of gambling in railroad, mining, industrial, and oil shares that often dislocated American finances within the past three decades? The pressing need of more rubber, the fear of an early shortage, the price-raising restriction of production in the Far East, and the widely heralded "declaration of independence" made by some leading rubber manufacturers in the United States, coupled with the plausible claim that the bulk of America's rubber needs can be supplied from territory under the Stars and Stripes with much gain for the producers are beginning to stir the American imagination. Many people are sensing a chance to combine profit and patriotism through duplicating in the Philippines the achievements of the British rubber growers in Malaya and Ceylon; and should any of the plans for exploiting the rich resources of the former Spanish colony even partly succeed, some lively trading in American "rubbers" would be almost inevitable.

What may be the forerunner of many efforts to enlist the aid of American capital in Far East rubber growing under quasi-national auspices is a recently organized American plantation company, a trust estate common law concern, the direction of which vests in a board of trustees removable by a court of equity and which body is expected to function similarly to and as efficiently as the Alien Property Custodian during the late war. The company has 2,471 acres in the island of Mindanao on which it plans to raise both rubber and cocoanuts in 100-acre squares. Advice which it sought from O. W. Barrett, former

director of agriculture of the Philippines, wholly confirms the claims which THE INDIA RUBBER WORLD has repeatedly made that Mindanao especially is an ideal place for rubber cultivation and that the *Hevea Brasiliensis* is the one tree which will live longest and yield the best and most latex. Tapping, Mr. Barrett says, may begin about the fourth or fifth year, and the annual yield will increase from an initial 120 pounds per acre up to 400 in the ninth year, and possibly very much more in later years. Catch crops of vegetables raised between the rubber trees would supply income while the trees were maturing.

The cost per acre for clearing is put at $35, planting $30, and for bringing into full bearing $35. It is claimed that an acre of mature trees should be worth between $150 and $300, with the trees better at 100 years than at fifty if the groves be well kept. Labor, it is said, is abundant, low-priced, and of excellent quality. The expected net income for the first five years is put at 45 per cent total (9 per cent annual average) on $500,000 invested; but after ten years the yearly net return is expected to reach 60 per cent as compared with British plantations that have paid as high as 210 per cent. Two points are stressed in the call for funds, one that the chance is not being taken on rubber alone and the other that American investors must be as patient as the British in waiting for returns on rubber planting shares.

Our Lucky Wage Earners

PROFESSIONAL labor agitators may not proclaim it from the housetops, but it is a fact, nevertheless, that the American wage earner is really better off now than he was during the peak period of 1920, and actually more prosperous than he has been in over a score of years. The National Industrial Conference Board has found, after a study of conditions in various plants employing a total of over 600,000 workers, that the "weighted" or comparative excess of rising wages over rising living costs was between 17 and 18 per cent greater in May, 1923, than in June, 1920, with the figures of the last pre-war month, July, 1914, as a basis.

Put it in another way; the present pay of the wage-earner has a higher purchasing power than his pay of three years ago, and his "real" earnings are about one-sixth better. It is a gratifying condition to employer and employe. Many a rubber manufacturer lost sleep in the middle of 1920 worrying as to how he could adjust selling prices to the abnormally high wage scale. But, luckily, the wage tide soon started to recede and with it in greater ratio the wave of high prices for nearly all commodities. At any rate, the lot of the wage earner has been much bettered and he is more contented, and hence less likely to listen to paid fomenters of industrial unrest adept in capitalizing adverse economic conditions.

"WHOSOEVER EXALTETH HIMSELF SHALL BE ABASED; and he that humbleth himself shall be exalted." Luke 14:11.

Understandardizing Hot Water Bottles

A FRIEND very deftly and interestingly calls attention to various defects in the ordinary hot water bottle. He also shows drawings of types that he believes would be of advantage to users. Enjoying his ideas, as we did, we cannot for an instant agree that more or different shapes are necessary. Indeed, just the contrary is our opinion, and this in spite of the fact that standardization has already cut the types from hundreds to dozens.

Of the few new types he advocates, the three-section bottle was patented twenty years ago, but was not popular, while the heart-shaped quilted affair was like the old Kommescher bottle that found few buyers. Freak bottles have never been given place on the counters of the druggists. One recalls the mitten bottle for cold hands, the foot-warmer with pockets for the pedal extremities, the "Nurse's Friend" with a pouch on the side for a midnight lunch. For doctors was one with a pouch for a pint of "extra dry," ice taking the place of hot water in the rubber bottle. Then there were bottles for chin, throat and spine, for bosom, and abdomen; but none of them won out. They were not salable, there was no money in making them, and only the patent attorneys and the inventors believed in them.

A RUBBER BALL ROLLS DOWN A HILL IN HOLLYWOOD, while on that hill a rubber tire rolls up; and this has nothing to do with the "movies," either. A motorist who cut off his power and was trying to coast discovered when half way down the hill that his car halted and began to move back up the 2.1 per cent grade for a considerable distance. Magnetic iron ore is believed to cause the phenomenon, and the only cars affected have been light, pneumatic-tired vehicles.

THAT PURE GUM RUBBER INSULATION REMAINS UNharmed while beetles bore through the lead sheathing of telephone cables is one of the odd discoveries of the Bureau of Entomology of the United States Department of Agriculture, which has been studying the damage done by the *Scobicia declivis* in causing short circuits. The same beetles bore through wine casks, corks on bottles, and even leaden containers in order to reach alcohol. Perhaps flasks, too, should be of rubber so as to be unboreable as well as unbreakable.

GERMANY'S MONETARY PLIGHT IS STRIKINGLY EXEMPLIfied in the case of the employes of the big Continental Caoutchouc and Gutta Percha Company of Hannover, which, on account of the government presses being overworked, has been forced to issue emergency money bills to pay its workers. Nearly eighty years ago rubber dollar bills were printed in New Haven, Connecticut, and they were good for 100 cents; but, stretch them as they might, the German rubber workers have not been able to buy more than two pounds of butter for a 200,000-mark bill. As a two-pound note, our British friends might say, it falls quite short of the mark.

Letters of Good Will and Appreciation

For More Than Thirty Years Our Friends Have Been Constant in Their Spoken and Written Appreciation of THE INDIA RUBBER WORLD and Its Management. During the Last Year, 1922-3, These Missives Have Been Many and Most Welcome. We Have Pleasure and Pride in Quoting the Following:

Broadening with the Years

"OUR sincere congratulations on the attainment by THE INDIA RUBBER WORLD of its thirty-third anniversary. The only change attributable to age which we observe in our respected contemporary is an increasing tendency towards 'adiposity,' not to say obesity, so often a sign of increasing years. The accumulation of adipose tissue is not a thing we should refer to in an individual without a considerable risk to friendship, but, periodical to periodical, shall we conceal our concern? The remedy, we think, may be weekly exercise; and one of these days, no doubt, you will commence to try it, giving up the sedentary habit of monthly appearances which you have followed for so many years. Are you aware that rolled in your usual wrapper you simply cannot be forced into the opening of the standard British post office pillar box? We had a practical demonstration of this fact the other day when sending our copy to a friend, and it should be a warning to you.

"Turning from our fun, which in deference to its subject may have become a little ponderous, we may say that everyone here is astonished at the remarkable recovery which is evidently in progress in the American rubber business; *vide* the Rubber Association figures. It is really amazing and confirms us in the belief that the fairy godmother who endowed you at birth, *viz.*, The American Rubber Industry, is a very wonderful and powerful old lady."

W. A. MACLAREN, Editor,
The India Rubber Journal,
London.

Devotion to Industry Appreciated

"Thirty-three years is a long period of service to an industry, exceptionally lengthy in the field of trade journalism. A third of a century devoted to the interest and the development of the rubber business is the claim that can be properly presented by our honored contemporary, THE INDIA RUBBER WORLD.

"The high regard with which it is held in the industry it represents is the best proof that can be offered that its efforts are appreciated and valued. The rubber industry should feel that congratulations are in order. We certainly are pleased to extend our best wishes for the continued success of THE INDIA RUBBER WORLD and its editor and founder, Henry C. Pearson."

Tires.
New York, N. Y.

Successes Won Through Service

"With the October, 1922, issue, THE INDIA RUBBER WORLD celebrated its thirty-third year of existence, a fact which excites the highest commendation and praise from the rubber industry, both in this country and abroad.

"The eminent position it maintains in the rubber trade has been entirely the result of hard work, cooperation, and service to the industry on the part of H. C. Pearson, its editor for one-third of a century, and his capable staff.

"It is with sincere pleasure that we congratulate THE INDIA RUBBER WORLD. May it continue to serve the rubber industry as efficiently for many more generations."

The Rubber Age,
New York, N. Y.

A World-Foremost Trade Paper

"THE INDIA RUBBER WORLD, the American trade paper for the rubber industry, is thirty-three years old. A third of a century under the same editor, Henry C. Pearson! We congratulate our American colleague most heartily. He has been able to create not only a first-class periodical for the American rubber industry, but in fact one of the soundest trade papers in the world. With deep earnestness, great foresightedness, and indefatigable urge for investigation he has conducted his paper, each number a richly-stored document of the progress and the significance of the rubber goods manufacture, each copy a wellspring of knowledge, of stimulation, of instruction.

"Today THE INDIA RUBBER WORLD is not only in the hands of every American rubber man, but is spread throughout the whole world, and is of truly international importance. May the editor be spared many years to continue his useful activities."

Die Gummi-Zeitung,
Berlin, Germany.

Wishes Long Life, Prosperity

"With pleasure we note that THE INDIA RUBBER WORLD is thirty-three years old—a third of a century—and always under the same editor. When our excellent publication reaches the same advanced age (we are just half as old so far—Editor, *Tropical Life*), I will refer to the fact that the only reason I win is due to the fact that you were born later!

"So here's long life and prosperity, coupled with sincere wishes for good health, to the I. R. W., its genial editor, and his very competent staff. When *Tropical Life* is one-third of a century, if its editor can run it from California—some parts of California—he will have much to be glad over and nothing, we should imagine, to grumble at."

Tropical Life,
London.

Worthily Chronicled Great Events

"It is with sincere feelings that we congratulate our contemporary, THE INDIA RUBBER WORLD, of New York, on the completion of thirty-three years' publication under the same editor.

"In Mr. Henry C. Pearson, its talented editor, THE INDIA RUBBER WORLD has found a journalist who has worthily chronicled the huge developments that have taken place in the rubber industry in the United States.

"Mr. Pearson has no doubt inherited some of the genius exhibited by his mother, who was a well-known American authoress, and his connection with the rubber trade, which started in 1872, has been one of continued successes. Speaking from a personal knowledge of Mr. Pearson since 1886, we have always recognized that whatever he has undertaken he has carried out in a thoroughly efficient manner.

"In congratulating our contemporary and its editor, we sincerely wish them continued prosperity and hope that the present editor may enjoy health and vigor to continue in the editorial chair until THE INDIA RUBBER WORLD reaches its jubilee."

The Rubber Age,
London, England.

Edited Masterfully

"Our contemporary, THE INDIA RUBBER WORLD, has completed the thirty-third year of its existence. During this third of a century this periodical has been published and edited masterfully by Henry C. Pearson. On this occasion we tender him our best congratulations and wish him the power to continue his activity in this field for a long time to come."

Le Caoutchouc et la Gutta Percha,
Paris, France.

Value Universally Recognized

"I should like to offer you my hearty congratulations on THE INDIA RUBBER WORLD completing its thirty-third year of publication and particularly on your having been its editor for that considerable period. I hope that the journal may continue its useful career uninterrupted for many years to come and that you will long remain at your post successfully directing its destinies.

"The value and excellence of THE INDIA RUBBER WORLD are universally recognized. It gives up-to-date information concerning what is going on in regard to rubber from start to finish, from the regular plantations now so widely established and from forest regions down to the finished articles of commerce, and in all that range it deals adequately with production and processes. Its articles descriptive of rubber countries in various parts of the world have literary charm, while its sections dealing with specialized aspects of rubber work are invaluable for reference and for keeping the workers in those sections up-to-date."

SIR FRANCIS WATTS,
The Imperial Department of Agriculture for the West Indies,
Trinidad, B. W. I.

Reflects Rubber's Rapid Rise

"Several rubber firms—Goodrich, Continental, and Pirelli among others—have celebrated during the last and present year the half-century anniversary of their foundation; and now we gather round THE INDIA RUBBER WORLD to feast its thirty-third year of life.

"These are, indeed, certificates of manhood of the rubber industry, and the collection of THE INDIA RUBBER WORLD is perhaps the most complete and valuable testimonial of the quickness with which the rubber industry has grown out of childhood, of the importance of the place it has taken among the industries of the world, and of the development of its technique on ever more scientific lines."

ALBERTO PIRELLI,
Pirelli & Co., Milan, Italy.

A Super-Technical Journal

"When, some eight years ago, the quarter centenary of THE INDIA RUBBER WORLD was celebrated you were good enough to publish a few lines from me, conveying, so far as my unfacile pen permitted, my deep appreciation of the individual services which your journal had rendered the rubber industry. Since then I have come to know THE INDIA RUBBER WORLD still better; and having, in a modest way, become something of a rubber journalist myself, I have learned to appreciate more fully the difficulties and pitfalls surrounding and associated with the production of a technical journal. Viewed in this perspective, I have come to regard your paper as something in the super-line; to be gazed upon with admiration; to be imitated perhaps, but not, in its own sphere, to be rivaled or equaled. The high quality of the matter, the sustained interest and masterly editing have placed THE INDIA RUBBER WORLD in the forefront of trade journalism, and long may it so continue, under the guidance, I hope, for very many years to come, of its first and present editor."

PHILIP SCHIDROWITZ, PH. D., F.C.S.,
The Chemical Laboratory, London, England.

Found All Over Europe

"I have just returned from another long trip through Europe and have visited France, Belgium, Germany, Norway, Sweden, Denmark, Austria, Czecho-Slovakia, and Italy, and the object of this letter is to congratulate you on the wonderful circulation THE INDIA RUBBER WORLD has, although it is printed in the English language. There is not one factory I have visited in these countries for the past three years that has not from time to time quoted THE INDIA RUBBER WORLD, and I find a copy on nearly all the desks of the heads of the concerns that I visit. It certainly speaks well of the interesting matter which is always contained in your paper, and personally, I find in it so much of interest to me that I generally take the latest copy on my trips."

E. E. BUCKLETON,
Buckleton & Nourry, Ltd., Liverpool, England.

Deservedly Well-Reputed Journal

"Please accept my congratulations to THE INDIA RUBBER WORLD as its existence reaches the third of a century.

"May good luck continue, and let the editor be host at many birthdays to come of this valuable and deservedly well-reputed journal."

E. MICHELIN,
Clermont-Ferrand, France.

Imparted Valuable Information

"May we congratulate you on the 33rd jubilee of your valuable paper, which, under your very able management, has imparted to all interested in the rubber trade much valuable information.

"We hope that your health may be such as to enable you to continue your life's work and enjoy the celebration of the 50th anniversary of the journal."

DR. HEINR. TRAUN & SOHNE,
Hamburg, Germany.

Exceptionally Helpful

"I notice that your paper is now able to look back on an existence of thirty-three years. Permit me to express to the esteemed editor my heartiest congratulations as well as those of my firm. The arrival of THE INDIA RUBBER WORLD each month is always a pleasure to me, and I continually gain from it new stimulation and suggestions as I gain from no other existing trade paper.

"I often recall with much pleasure the occasion in 1905 when I had the good fortune to become acquainted with the editor and the most cordial reception he gave me. It is always gratifying to hear from our Mr. Julius Lehmann, with the Borgfeldt firm in New York, that you frequently inquire after me. I hope that I may soon have the pleasure of again seeing you personally.

"With assurances of my highest regard, I am, very truly yours."

General Manager, Hannoversche Gummiwerke Excelsior,
Hanover-Limmer, Germany.

From World's Pioneer Rubber Company

"I am very much interested to know that THE INDIA RUBBER WORLD completed its thirty-third year of publication with the same editor in charge. May I be allowed to send to you and to the paper the heartiest congratulations of our company, now approaching its 100th year, and of myself personally. The rubber trade on this side usually looks upon Mr. Henry C. Pearson and THE INDIA RUBBER WORLD as being one and the same thing, which after thirty-three years is hardly to be wondered at, and I am sure that many a rubber man in this country (myself among them) owes a very great deal to you for kindly help and introductions when visiting the United States.

"I sincerely hope I may have the privilege of again congratulating both yourself and the paper seventeen years hence."

PHILIP A. BIRLEY,
Chas. Macintosh & Co., Manchester, England.

Honored Institution of the Trade

"THE INDIA RUBBER WORLD has for many years been with us, as with most members of the rubber trade, an institution on which we have learned to rely and to which we always look for a broadness of outlook and sanity of view that is an undoubted asset to the trade.

"I cannot refrain from adding my congratulations to you personally, and assuring you of how much the trade as a whole is indebted to you for your unsparing and untiring devotion to its interests."

A. C. JOHNSTON, President,
North British Rubber Co., Ltd.,
Edinburgh, Scotland.

Of Incalculable Value

"A third of a century is a long term of service in any office, and I wish to extend to you my very sincere congratulations. It must be exceedingly gratifying to you, as it is to those of us who have read the publication during all that period, to realize how greatly it has grown in importance and value to the whole industry under your able leadership. I well remember your visit to this city shortly after the paper was started. We then became subscribers and hearty advocates of it, and have so continued ever since. It may be of interest to you to know that we have a complete file of every number published, as, from the start, we made a practice of having each volume bound and placed in our library for reference.

"Probably the most valuable record extant of the growth and development of the rubber industry is contained in its pages, and the extent of its value to those engaged in the business is entirely beyond appraisement. I trust that you may be spared to complete at least a full half century of the good work and that the periodical, itself, will continue to grow in interest and importance and thus fulfill the tradition of its past."

C. N. CANDEE, President,
Gutta Percha & Rubber Co., Ltd., Toronto, Ontario, Canada.

Progressive and Ably Managed

"I know the high esteem that THE INDIA RUBBER WORLD and its editor are held in by manufacturers and the trade in general in the United States and other countries of the world as being progressive, ably managed, and containing at all times authentic information that is timely and highly valued by all of us. To you personally, we wish for your good health and continuation of your able management, and for THE INDIA RUBBER WORLD continued success for many years to come."

F. O. WILLIAMS, President.
The Seamless Rubber Co., New Haven, Connecticut.

Clearing House of Information

"I wish to offer my congratulations on the long service record of THE INDIA RUBBER WORLD, and for your long and valuable connection with it. Your publication came into being in the early stages of the rubber industry and has kept pace with its great growth. It has been a clearing house and source of information, and we wish both you and your publication long-continued prosperity."

P. W. LITCHFIELD, Vice President,
Goodyear Tire & Rubber Co., Akron, Ohio.

Wishes Long Life

"It is with great pleasure that I write congratulating you on your 33 years' success in the management of THE INDIA RUBBER WORLD. I hope, as does *The Rubber Age*, that we may all be able to congratulate you again seventeen years from now."

DAVID A. CUTLER, President,
Alfred Hale Rubber Co., Atlantic, Massachusetts.

Proud of It

"We all believe in THE INDIA RUBBER WORLD and are proud of it."

B. G. WORK, President,
The B. F. Goodrich Co., Akron, Ohio.

Rubber Mentor for Generation

"I did not realize before that you had been the rubber mentor for a third of a century, and I do not know of another editor living who can make the same statement. I extend my warmest congratulations upon your achievement. The work of your lifetime has been of very great value to the industry and I trust it may continue, with its strength unimpaired, for many years to come. I often recall the very pleasant journey we had together for a thousand miles up the Amazon twelve years ago. With my best wishes to you, I remain,"

F. A. SEIBERLING,
Seiberling Rubber Co., Akron, Ohio.

Important Help to Industry

"We congratulate you on the very great success you have made of your good publication, which, without doubt, has been an important factor in the development of the entire rubber industry. A review of what you have accomplished and contemplation of what THE INDIA RUBBER WORLD will accomplish in the future must indeed be very gratifying."

T. W. MILLER, President,
Faultless Rubber Co., Ashland, Ohio.

An Epochal Experience

"The fact that you and your publication have been closely in touch with the developments of rubber production and manufacture for the last 33 years is really epochal. The changes and developments that you have seen in that time prove that truth is stranger than fiction.

"I take this occasion to congratulate you warmly for the part you have played and for the faithful service you have given the cause. May you have many more years of activity and prosperity."

N. O'NEIL, President,
General Tire & Rubber Co., Akron, Ohio.

Long Record of Service

"Permit me to felicitate THE INDIA RUBBER WORLD upon its 33rd anniversary. This is indeed a long record of service to the rubber industry in which you and THE INDIA RUBBER WORLD have long taken a permanent place. I wish you and the WORLD continued success.

ALFRED B. JONES, Former President,
Kelly-Springfield Tire Co., New York, N. Y.

Well Worthy of Recognition

"Permit us to congratulate you on the occasion of the 33rd birthday anniversary of your publication. This is a record of usefulness to our industry well worthy of definite recognition."

O. B. CARSON, Manager, Advertising Department,
American Hard Rubber Co., New York, N. Y.

Stabilizing, Constructive Force

"Permit me to tender you my sincere congratulations on the occasion of the thirty-third birthday of THE INDIA RUBBER WORLD. In these days of journalism, when sensation supersedes accuracy, when evil is magnified at the expense of good, when policies outrank principles, it is refreshing to read those journals which have good citizenship, law and order, and the public interest as their fundamentals. I have never read an article in your paper that was other than constructive in thought, high in purpose, and upbuilding in interest for the industry of which you and your paper have been the spokesman for so many years. Long life to you and many happy returns of the day!"

FREDERIC C. HOOD,
The Hood Rubber Co., Watertown, Massachusetts.

Most Carefully Edited

"You unquestionably issue one of the most carefully edited technical publications of which I have knowledge. You present a wealth of up-to-date information which should be of the utmost value to all concerned with the progress of the rubber industry. The paper is typographically the most practical, while the illustrations are carefully selected."

P. L. HOFFMAN, Dean of Advanced Department,
Babson Institute, Wellesley Hills, Massachusetts.

Greatly Aided Industry's Growth

"May we extend to THE INDIA RUBBER WORLD our sincere congratulations upon its thirty-third anniversary. The present editor, who founded the paper in 1889, has given to the rubber trade a helpful, well-informed publication and has largely contributed, through his paper and his personality, to the remarkable growth of the rubber industry during the last quarter century. Its technical articles, its travel features, and its personals have given readers a knowledge of the development of the rubber industry and of the men who are recognized as its leaders in all parts of the world.

"We extend our felicitations not only for the present but for the future, with confidence that its high standing will be maintained and its influence increased." TYER RUBBER CO.,
Andover, Massachusetts.

Rubber Industry's Encyclopedia

"I learned with surprise, and certainly with great pleasure, of THE INDIA RUBBER WORLD's thirty-third anniversary. How time goes! As I look back it hardly seems more than a few years since this journal was started, and when I remember the original issues and compare their contents with what we have now, I realize what you have accomplished for the benefit—and I am sure it is a very great benefit—of this industry. It is true, there have been great developments in it during the thirty-odd years. Many new concerns have taken their places and the great tire development has occurred; and then the war has increased capacities, consequently production in the various lines, beyond anything hitherto dreamed of. Then the plantations came in, which were unknown when THE INDIA RUBBER WORLD was born. But you have kept pace with all this development, and have given your readers full information and minute detail on everything of great and even passing interest to your subscribers.

"As the journal stands today, it is an achievement and I hope it will go on and prosper and continue to be, as it is, of incalculable interest to those in the rubber industry and an encyclopedia of what has taken place in one of the greatest industries in the world." HENRY SPADONE, President,
The Gutta Percha & Rubber Manufacturing Co.,
New York, N. Y.

Constant Reader 33 Years

"Your having continuously edited this publication during the entire period of its existence is certainly an accomplishment of which you may be justly proud. I have personally seen THE INDIA RUBBER WORLD perhaps for the entire thirty-three years, and have thus had the privilege of watching its growth and its importance to the rubber industry.

"Your personal visits in the Amazon territory, the home of Pará rubber, which we all made use of in the years gone by, were the most interesting articles it has ever been my pleasure to read. I want to take this opportunity as one of your old friends to congratulate you upon the wonderful success that has been achieved by THE INDIA RUBBER WORLD by its able management, editorially and otherwise, of your good self. May you continue thirty-three years more and then some." EDWARD E. HUBER, Secretary,
Eberhard Faber Rubber Co., Newark, New Jersey.

Policy High-Minded, Conscientious

"We compliment THE INDIA RUBBER WORLD on so successfully rounding out the first third of a century of its existence, and we also extend to its editor our compliments and congratulate him on having continuously remained its editor for that length of time. We are sincerely hopeful and trustful that the publication will continue in its worthy sphere, and while it may be presuming a little too much to expect its present editor to remain with it for another thirty-three years, we hope that as much of that time as he may choose to devote to the editorial work may be his privilege, and that his labors may continue in their fruitfulness and remain of that high-minded, conscientious character that has so markedly distinguished them in the past."

PARKER, STEARNS & CO.,
Brooklyn, New York.

The Bible of the Industry

"Everything considered, I do not know any trade paper that has been so intimately connected for a long term of years with the development of the industry it served as THE INDIA RUBBER WORLD has been and is with the rubber manufacturing interests.

"As I see it, THE INDIA RUBBER WORLD has been nothing if not constructive. One might call it the 'Bible' of the industry without exaggeration or fear of contradiction.

"Surely the thirty-three years' work of the editor of THE INDIA RUBBER WORLD is something to be proud of, and congratulations are in order."

E. C. TEBBETS, for many years Advertising Manager,
The B. F. Goodrich Co., Akron, Ohio.

Inspiration to the Trade

"On behalf of our President, Mr. George E. Hall, we take great pleasure in congratulating THE INDIA RUBBER WORLD on the completion of its thirty-third year as a trade journal of the highest class.

"Its standards which you have consistently maintained have been an inspiration to the rubber trade in general, and as a news journal and chronicler of achievement in the rubber industry, we do not believe your paper has an equal."

BOSTON WOVEN HOSE & RUBBER CO.,
Boston, Massachusetts.

"Live Long and Prosper!"

"Referring to your thirty-third year business birthday, I offer you my hearty congratulations, and in the language of my old friend, Ben Ali Haggin, 'May you live long and prosper.'"

A. D. TOWNSEND, President,
Manhattan Rubber Manufacturing Company, Passaic, N. J.

Most Helpful to Trade

"We wish to extend our hearty congratulations both to the magazine and to its editor. This combination has been most helpful to the rubber trade in many ways, and we hope that your success will continue for a long period to come."

JUDSON DRAYTON, President,
Vulcanized Rubber Co., New York, N. Y.

Was Greatly Benefited

"I personally wish to extend to you my congratulations on your thirty-third anniversary. During all these years we have faithfully read THE INDIA RUBBER WORLD, as it contained valuable information which proved in my case helpful to us in business. We are quite sure that we have received great benefit from the advertising we have done in THE INDIA RUBBER WORLD. Your ability and high character have always been noticeable in reading it, and I hope that you will round out a half century in its publication." L. D. APSLEY, President,
Firestone-Apsley Rubber Co., Hudson, Massachusetts.

From First Advertiser

"I want to take this opportunity of extending my congratulations to you upon the long and successful career which your magazine has enjoyed under your management. As a matter of interest it is perhaps worthy of note that the first advertisement secured by The India Rubber World was from the Hodgman Rubber Co." George B. Hodgman, President,
Hodgman Rubber Co., Tuckahoe, New York.

Advertised Since Beginning

"We would like to take this occasion to congratulate you on the thirty-third birthday of The India Rubber World. As you know, we have, we believe, been with you ever since it started, and, as far as we know, we expect to be with you as long as we are in the business of supplying rubber machinery.

"The merit and position of The India Rubber World are well recognized by all, we believe, in the industry, and in fact it is so well known and so highly appreciated that anything we could say would probably be superfluous.

"We wish you all kinds of success for the future and look forward to the continuance of our pleasant relations."

F. Farrel, Jr.,
Farrel Foundry & Machine Co., Ansonia, Connecticut.

Clean, Truthful, Helpful

"I have always found that you have run the paper as a clean and truthful paper, and have tried to have your articles such as to be helpful to the trade. During this time you have visited different rubber centers and have kept your readers in touch very thoroughly with the rubber trade both in the raising of the rubber and in the manufacture of the same. Once more, therefore, I want to congratulate both yourself and The India Rubber World on the very successful way the paper has been conducted and grown during your editorship.

"Some years ago I had the opportunity and pleasure of congratulating you upon the twenty-fifth birthday of The India Rubber World and now on the completion of its thirty-third year of publication under the leadership of its same able editor, I take occasion to renew my congratulations and very best wishes in the hope of its long continued success and that I may have the good fortune to renew these same wishes upon its fiftieth anniversary."

Chas. J. Davol, President and Treasurer,
Davol Rubber Co., Providence, Rhode Island.

Its Fairness Wins Friends

"I know of no industrial paper that has continuously and conscientiously preserved a more dignified and impartial attitude toward the industry as a whole than The India Rubber World, and it has certainly merited the success which it has achieved. While it is unquestionably true that a large contribution to this end has been made by your staff, it has been done under your leadership and inspiration. Hearty congratulations and sincere hopes that you and those associated with you may see the fiftieth anniversary." Homer E. Sawyer, Vice President,
United States Rubber Co., New York, N. Y.

Marvels at Its Growth

"I well remember the time when The India Rubber World was first issued and I am sure that neither yourself nor myself had at that time the slightest conception of what the paper would grow to be in thirty-three years. As I compare the two periods, it seems hardly possible that the present issues could have grown out of those early ones. There can be no doubt that this success has been due to your untiring devotion. It is very rarely that a publication is carried on from its inception by the same editor for thirty-three years.

"Please accept my congratulations on the completion of this long period and my best wishes for the continued success of the World under your direction for a long time yet to come."

A. O. Bourn,
Bourn Rubber Co., Providence, Rhode Island.

Interesting Letters From Our Readers

"Father or Suggester?"

To the Editor:

Dear Sir: Historians may differ widely as to when and where Homer was born, and express all sorts of opinions about events in the misty past, and the indulgent world will withhold its censure; but it is not so lenient with the annalist who fails to state the essential facts about conspicuous occurrences in our own day and generation. I have in mind particularly the story of American enterprise in planting rubber in the Far East. Although exact information about the origin of this industry is readily obtainable, statements have been published lately about the matter that, to put it mildly, are very incomplete.

The India Rubber World pointed out that the first American plantation was installed in the Far East by the Pahang Rubber Co., Limited, of which Dr. E. C. Waterhouse was president and guiding spirit, in 1906; and he, it says justly, might well be called the father of the American rubber plantation movement. On the other hand, *The Rubber Age*, New York, in an article entitled "Father or Suggester," contends that such title belongs to John J. Watson, Jr., "who first suggested to the directors of the United States Rubber Co. in 1908, that they investigate the possibilities of cultivating rubber in the Far East." The earlier plantings by two Waterhouse companies total 2,000 acres and the later plantings of the United States Rubber Co. 58,000 acres. Obviously the pioneer Hevea planter was Dr. Waterhouse, and not Mr. Watson, although the latter rendered signal service to the industry in later enlisting the interest of Col. Samuel P. Colt, and the big rubber company of which he was the head, in Hevea cultivation.

Research discloses the fact that the original proponent of American rubber planting in the Far East was really The India Rubber World, which, through its editor, as long ago as 1890, started a definite campaign to stir the interest of Americans in rubber cultivation. Long before the advent of the esteemed Mr. Watson a succession of articles appeared, and the practicability and manifold advantages of rubber planting were graphically demonstrated. This is a simple matter of record. To obtain first hand information the editor made extensive tours in the rubber regions of both hemispheres; and no less a leader in the industry than Harvey S. Firestone is quoted as saying that American rubber men were deadly afraid of the tropics until Mr. Pearson went there to study wild rubber and rubber planting possibilities; and then others followed.

As a matter of fact the publication of the exhaustive survey made by Mr. Pearson quite antedated the activities of either Col. Colt or Dr. Waterhouse. "What I Saw in the Tropics" has long been a travel classic; and "Rubber Planting in the Far East," a series of letters by the same author, was really the first bit of authoritative information rubber manufacturers had received as to then existing and prospective sources of raw material. So well was Dr. Waterhouse impressed with the practical, comprehensive character of these letters on planting that he cabled to The India Rubber World asking permission to use the articles in a prospectus for his first planting company. Permission was granted, the company was floated, and the enterprise succeeded, it is gratifying to note.

It is only fair to give credit where it is due. If Mr. Pearson was not the pioneer in planting he was certainly the precursor who prepared the way. Nor should *The Rubber Age* be chided for being unfamiliar with early rubber history; it could hardly be expected to know much about things that happened long before its time.

Los Angeles, Calif. P. A. McAviney.

Web Cord Tire Fabric

An Important Development in Tire Construction—The Web Cord Machine—Forming the Web—Dipping and Drying—Advantages of Web Cord Fabric

RUBBER technology has made notable advancement in recent years, especially as relates to the manufacture of automobile tires. Three steps in this advance are credited to the development department of the United States Rubber Co., the first of the improvements being chronicled in THE INDIA RUBBER WORLD early this year,[1] and the second only three months ago.[2]

The third advance is recorded in the following description of the machine and process employed to manufacture the web cord fabric.

The new type of cord fabric is important chiefly because its construction has been demonstrated to be as great an advance over the usual cord fabric construction as the latter is over the earlier square woven fabric. The differences of these three constructions may be noted in Figure 1, A, B, and C. The first automobile tires made with close cross-woven fabric A were strong and stiff, but in service developed much internal heat, due to the friction of the woven cabled yarns, and rapidly deteriorated from this cause. Its use is therefore limited.

The introduction of the ordinary cord construction B, in which relatively weak filler threads are spaced at wide intervals, was made with the expectation that the cross threads would break when under service conditions and by so doing the heat of internal friction would be eliminated. This fabric produces a notably better tire than the construction shown in A but still permits much internal friction because the cross threads do not always break and some cross-sawing effect remains.

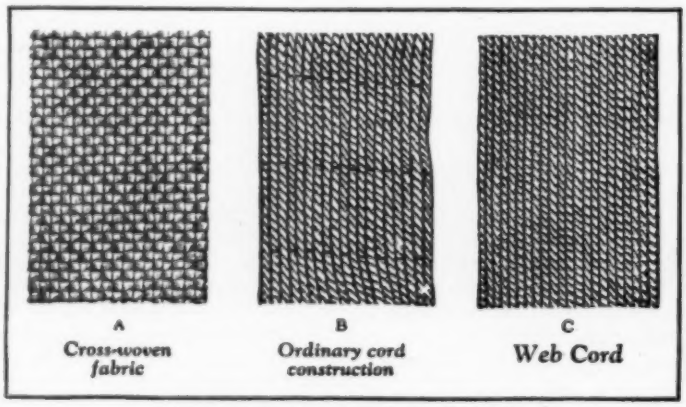


Fig. 1. Evolution of Web Cord Fabric

In the web form construction there is complete absence of cross threads for holding the cords in orderly arrangement which is better and more permanently accomplished through the simple process of rubberizing the cords in sheet form by passage through rubber latex. This at once eliminates both fabric loom and friction calender, penetrates and insulates each cord in the web and unites them into a perfectly rubberized sheet. The cords are thus individually cushioned by rubber which acts to prevent friction as the cords rub by action of the tire.

The Web Cord Machine

In the factories of the United States Tire Co. the machines for producing rubberized web cord occupy a space approximately 160 feet long, 20 feet wide, and 15 feet high. It is essentially a succession of machines set tandem, each performing its particular function, and all operating in unison. It receives spooled cords at the creel and delivers dry rubberized web cord in 1,000 pound rolls at the opposite end. The subdivisions of the complete machine named in the order in which they succeed each other are: (1) the creel; (2) web cord forming section; (3) latex tank and dipping mechanism; (4) latex supply system; (5) drying apparatus; (6) wind-up for finished web.

The Creel

The creel is a strong open frame about 50 feet long, 20 feet wide and 15 feet high, built in two stories. The stanchions for the support of the spooled cord are arranged in rows lengthwise with aisles between rows for convenience of the attendants who supervise the delivery of the cords from the creel and maintain the supply uninterruptedly. The creel has a capacity of over 3,000 spools of cord, each spool holding several thousand yards. Half the active and half the idle spools are on each story of the creel. These spools do not revolve as they deliver the cord but remain stationary upon their individual supports that are inclined at a predetermined angle and attached to the stanchions.

The spooled cord is wound by the universal system which admits free and rapid unwinding. The inclination of the spools is fixed at a critical angle which was determined only by close study and experiment, and is such that the lightest pull exerted upon the cord causes it to leave the spool uninterruptedly and without strain or twist. The slack formed as the cord falls freely downward and away from the top of the spool is ample to loop over the stock on the spool as the cord surmounts the top from the opposite side and falls away in the succeeding loop.

The object of providing equal number of active and idle spools on the creel is to insure continuous supply of cord for the web. The last end of the active spool is tied to the first end of the idle one, thus transition is made automatically to a full spool without interruption of the supply or change in the unwinding action.

Each cord as it leaves the spool threads its way toward the next stage through holes, or eyes, with enameled edges, set in stanchions along the aisles, past the creel attendants, thence through other similar holes arranged in a series of plates extending the width of the creel, by which cords from the active spools in the upper story of the creel are given space relation with the same number of cords from the lower story of the creel. At this point the function of the creel ends and that of the web cord forming section begins.

Web Cord Formation

Concentration of the dry cords from the creel into sheet form preliminary to rubberizing by dipping into latex is accomplished under the observation of an inspector who stands upon a raised

[1] "Far-Reaching Developments with Rubber Latex." THE INDIA RUBBER WORLD, January 1, 1923, 207-9. "Manufacture of L. S. Crude Rubber." THE INDIA RUBBER WORLD, June 1, 1923, 553-4.

[2] "Flat Band Built Cord Tires." THE INDIA RUBBER WORLD, July 1, 1923

platform that he may conveniently manipulate the cords as they pass above his head. This section of the machine begins with an eye plate through which the cords pass from the more open eye plate at the adjacent end of the creel and ends with the rollers through which the web passes downward into the latex tank. At this point it should be noted that the edges of the eye plates are marked vertically with letters and horizontally with numerals, serving to identify each cord in the web with the corresponding spool in the creel for adjustment and quick repair of broken cords.

Between the die plates mentioned the inspector is stationed. He watches the cords as they pass above his head, detecting broken cords and tying them as they occur, without stoppage or delay to the progress of the fabric. Following the eye plates the spacing of the cords in the web is effected by an adjustable comb through which they pass just before descending between rollers into the latex tank.

Dipping Mechanism

The dipping mechanism comprises a series of rollers which convey the web into and out of the latex tank and remove from it by friction contact the excess of latex which runs back into the tank.

The latex tank is supported at each corner on hydraulic rams by which its height can be adjusted relative to the dip rollers. The latex supply to the tank is maintained by a pipe line from a storage tank delivered by air pressure. Figure 2 shows the web dipping mechanism with the web emerging from the latex; also a comb, adjustable for width, from which the excess latex raised by the web streams back into the tank. Before reaching the drying section the web is further freed from its excess of latex by drawing over two "doctor" bars or knife edges and through a set of rapidly revolving burnishing rolls which expel the final excess of latex.

The coated web as it starts over the first drying drum meets a wide cotton liner fed from below, on which it is carried during the drying process and in which it is rolled on a shell at the wind-up.

The Drying Section

Latex is about 70 per cent water and 30 per cent uncoagulated caoutchouc containing other vegetable substances in small amounts. Freshly dipped web, therefore, contains a large weight of water, the complete elimination of which is effected by the drying section of the machine that delivers the dry finished web in continuous lengths at 15 to 20 yards per minute.

The drying mechanism consists of a train of five low pressure steam drums, around which the dipped web on its cotton sheet liner passes from drum to drum and finally reaches the wind-up.

The Wind-Up

The dried web is rolled up in its liner on a shell by a pair of two-roll wind-ups arranged tandem. Each wind-up consists of an upper driven roll and a lower roll. The shell rests on the upper roll and when built up to size with fabric is rolled ahead onto and across a sheet of steel which bridges the interval to the second wind-up, on which the full roll is completed. This point is determined by the indication of yardage read from a yardage meter under which the dry web runs.

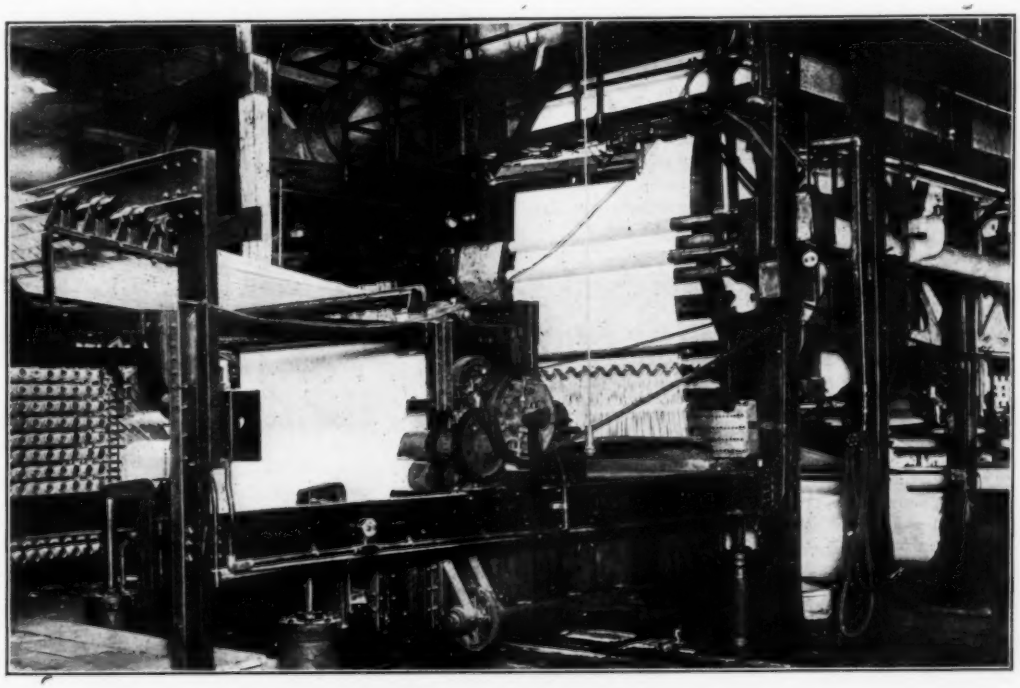


Fig. 2. Web Cord Dipping Mechanism

When correct size is reached the machine is stopped long enough, usually not over ten seconds, to allow the web to be cut by drawing the blade of a hand knife through it. The next roll is started on the first wind-up on a shell placed in position as soon as the preceding roll is displaced. The process is thus virtually continuous. The usual size roll weighs about 1,000 pounds gross, which is as bulky and heavy as can be conveniently handled at the calender.

Advantages of Web Cord

The advantages of web cord fabric are evident. It is perfectly uniform and free from distortion, twisted cords and strains. There are no cross cords or yarns to set up a sawing action in the fabric when in service in a tire. The latex treatment produces perfect and intimate rubberization even to the interior of every individual fiber in the cord and eliminates the preparation of crude rubber and the usual cotton and rubber manufacturing processes up to and including frictioning.

The Japanese Rubber Industry Before the Earthquake

Extent of the Industry—Rubber Factories of Tokyo, Yokohama, Kobe and Osaka

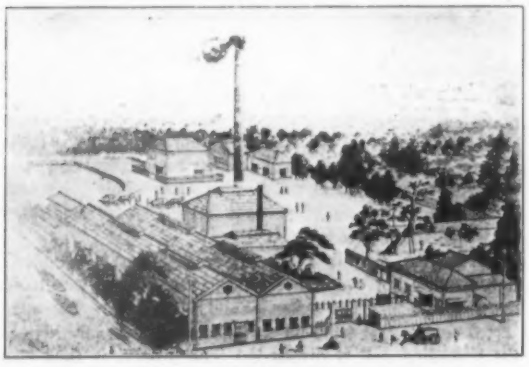
THE terrific earthquake, followed by fire and tidal wave, which on September 2 took an appalling toll of Japanese life and property, has seriously crippled but by no means destroyed the flourishing young rubber industry of the "Island Empire." While the fate of many rubber concerns still remains unknown, it is certain that Yokohama was literally wiped out and that the commercial and industrial districts of Tokyo lie in ashes. In these cities, more especially the latter, were located many rubber goods factories, large and small, owned by natives, Americans, and Europeans, several being comparable in plant and product with many well-known American firms.

While it seems probable that most of the rubber plants in the devastated districts were either destroyed or very seriously damaged, it is certain that the courageous and progressive Nipponese will soon restore their rubber industry to the high place it won in such a short span of years. For this restoration the foundation already exists, for the great industrial cities of Osaka and Kobe remain intact with their numerous enterprising rubber companies.

Extent of Japanese Rubber Manufacture

Although the importance of Japan as a market for rubber goods has been recognized for several years, few realize the extent of her rubber manufacturing industry. This business has grown so rapidly during and since the war under the protection of high customs duties that exports of rubber goods now greatly exceed imports. In 1919 exports amounted to $9,689,922 against imports amounting to only $1,422,966.

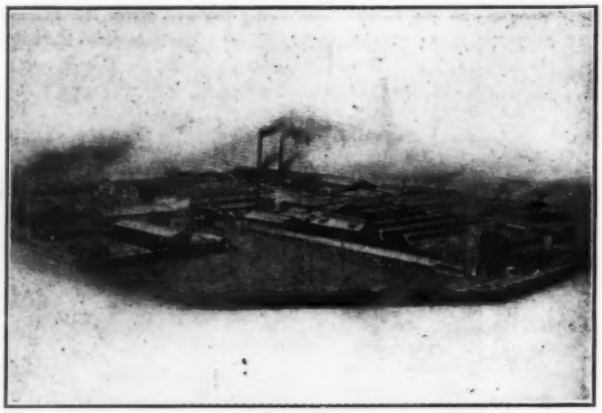
On the outbreak of the war rubber goods shipments from England and Germany to Japan, China and all Far East countries were soon curtailed or stopped. The opportunity and need thus presented were quickly seized and met by Japan. New companies were organized, new factories were erected, old ones were enlarged, and the production of numerous rubber goods not formerly made in Japan was undertaken for home consumption and for export to other countries throughout the Orient where the use of rubber goods has become widespread in recent years.



Typical Japanese Rubber Factory in 1915

Tires for bicycles, jinrikishas and automobiles, which formerly were largely imported, are now supplied to meet virtually the entire home demand and also extensively exported. The same is true of insulated wire and cable, which are playing such an important part in modernizing the Far East. Toys, balls and balloons have become important Japanese manufactures and exports, and considerable quantities of hose, sheeting, insertions, various types of shoes and druggists' sundries are also being produced.

In 1914 there were in Japan 60 general rubber companies having an aggregate capitalization of $2,500,000 and employing 4,000 hands, and 8 insulated wire companies having a capitalization of $3,000,000 and employing 3,000 hands.



Fujikura Insulated Wire & Cable Co., Tokyo, Japan

The following table shows the rapid development of Japan's rubber manufacturing industry in recent years.

Year	Factories	Employes	Output in Yen*
1915	265	5,043	6,703,796
1916	154	7,137	11,240,169
1917	166	6,618	15,028,864
1918	188	8,245	22,955,559
1919	327	11,543	32,432,324

*One yen equals $0.4985 at normal exchange.

There were also 28 insulated wire factories in 1919, employing 3,654 persons, the value of the output being 26,554,500 yen, as compared with 17 firms employing 1,134 persons, and having an output valued at 4,357,643 yen in 1915.

The next table illustrates the magnitude of the tire industry.

	1917 Yen	1918 Yen	1919 Yen	1920 Yen	1921 Yen
Rubber tires	2,176,225	4,506,000	7,114,037	8,018,064	4,478,426
Various rubber goods	614,230	1,225,000	2,510,000	1,527,000	771,979
Rubber toys, etc.	228,420	766,540	1,339,734	2,574,665	1,248,621
Insulated wire	3,118,000	8,324,000	8,411,700	8,043,332	3,273,092
	6,136,875	14,821,540	19,375,471	20,163,061	9,772,118

Two Rubber Centers in Japan

The Japanese rubber manufacturing industry has grown up in two districts about 250 miles apart, the first centering in Tokyo and Yokohama, and the second and larger in Kobe and Osaka.

The rubber plants in the latter district are intact and at capacity production can meet much of the immediate demand developed by the disaster. While many of the destroyed Tokyo plants will undoubtedly be rebuilt, several had branches in the Kobe-Osaka district which will probably be enlarged at once and in some instances may replace them permanently.

As a result, the Kobe-Osaka district, already in the lead because of its better shipping facilities and situation with respect to export markets, now promises to prosper more than ever in commerce and industry and to become the unquestioned center of

the Japanese rubber industry. It already outstrips the Tokyo-Yokohama district in imports of crude rubber, and in both imports and exports of rubber manufactures, although the rubber manufacturing industry of Japan began in Tokyo. As compared with crude rubber imports in 1912 of 1,023,052 pounds at Yokohama and 970,897 at Kobe, the corresponding imports in 1920 were 9,933,520 pounds at Kobe and only 3,028,855 pounds at Yokohama, these amounts being only a little over half the total imports in 1919.

Osaka is the commercial and industrial center of the southwest half of Japan, and the chief trading place with Korea, Formosa, Manchuria, China and the South Sea Islands. Kobe, situated near Osaka, is the largest open port in the western half of Japan, and the biggest trading port of the Empire. Tokyo is commercially the center of the northeast half of Japan, and Yokohama, its port, was formerly Japan's greatest trading port.

History of the Tokyo Rubber Industry

Of the 130 rubber factories said to have been located in Tokyo in 1920, the earliest rubber manufacturing enterprise in Japan was the Tsuchiya Rubber Works, established in 1880 at Kamiyoshicho, Asakusa, Tokyo, by H. Tsuchiya and T. Tasaki for the manufacture and repair of divers' suits by primitive methods. In 1884 this business became the Mitatsuchi Rubber Manufacturing Co., and in 1889 a line of bulbs and packing was added to its product. In 1892 the factory was removed to Narihiracho, Honjo, Tokyo, steam vulcanization was introduced and a year later the manufacture of ebonite and suction hose was begun. The business expanded greatly under government support during the Chinese-Japanese war of 1894-5 and is now one of the most important rubber firms of the empire with a diverse product including tires, footwear and mechanicals.

The Nippon Rubber Co., Limited, another large concern, was established in 1900 by the consolidation of two firms with W. Yamasaki as director. One was the Yoshida Rubber Works, which had been established at Hisakata-cho, Tokyo, by S. Yoshida and W. Yamasaki in 1896, the other the Motohashi Rubber Works established at Hashibacho, Asakusa, by R. Motohashi. The plant was burned and rebuilt in 1911 and enlarged in 1915. Tires, mechanicals, especially hose, gloves, balls, belts and dolls are the principal products.

The Meiji Rubber Manufacturing Co., Kitashinagawa, Tokyo, one of the oldest and largest rubber factories in Japan, was established in 1892 as a partnership known as the Tokyo Rubber Manufacturing Co., by G. Matsumoto and S. Morita, but soon suspended business owing to the death of its engineer, Mr. Saito. In 1896 the plant was purchased by K. Kamijo, and with K. Kamada business was begun under the name of the Tokyo Rubber Factory. In 1901 the late G. Yonei bought the factory, changed the firm name to its present form and introduced European methods and machinery under the technical direction of A. T. Ferguson, an Englishman. Mechanicals, tires, balls and ebonite are the principal products.

The above companies, with the Tokyo Rubber Co., Limited, founded in the early eighties by Mr. Ogiwara for the manufacture of mechanical rubber goods, are the four oldest and largest in Tokyo, and in 1920 were parties to a selling combination to complete against the Dunlop Rubber Co., Far East, Limited, in Siberian and other foreign trade.

In the production of rubber covered wire the Fujikura Insulated Wire & Cable Co., of Tokyo, was the pioneer and is now the largest producer in Japan. The business was founded in 1884 by the late Zenpachi Fujikura, who had previously been engaged at Kanda in making cotton braids and silk and cotton flexible lamp cord. Not until 1892, however, did the firm succeed, after much experiment, in producing a rubber-like insulating compound in the factory at Shinjiku, to which the business had been moved in 1886. Much credit for this development is due to Tomekichi Matsumoto, a younger brother of Mr. Fujikura and the present head of the concern. Further technical progress was largely due to the study of American methods by Kenzo Okada, a nephew of Mr. Fujikura, who returned to Japan in 1899 and installed up-to-date machinery in a new and larger factory at Tokyo. This plant was demolished by a hurricane in 1903 and rebuilt double size, only to be half burned in 1911 and again enlarged. The firm has prospered as the approved manufacturer of insulated wire and cables for the Japanese Government and has succeeded in the export trade through close adherence to the standards of the British Cable Makers' Association.

The Yokohama Rubber Industry

The principal rubber factory in Yokohama is the Yokohama Rubber Co., Limited, in which The B. F. Goodrich Co., of Akron, Ohio, is heavily interested. While the exact amount of loss sustained by this company has not been definitely stated, it is understood that the plant, one of the largest of its kind in the Orient, is practically ruined. The works cover nearly eight acres, and nearly 3,000 people have been employed. The general manager is Frank R. Carroll, former Goodrich branch manager in Los Angeles, California, who, with his family, escaped the great disaster.

F. R. Carroll

The buildings of the Yokohama Rubber Co. were entirely of brick, one and two stories high, and were used for the manufacture of tires, shoes, mechanicals and other staple rubber goods. It has a large athletic field and various organizations for promoting the welfare of the workers. The works were established about five years ago, and, as is customary in Japan, in the directorate were included several native capitalists who were heavily interested in mining, shipping, and manufacturing. That the damaged plant will soon be rehabilitated is a foregone conclusion. It is understood that, owing to the fact that the works were situated in a low section of the city, convenient to tide-water, more injury was done by the tidal wave than by fire or earthquake.

Next in importance, and once the largest insulated wire plant in Japan, is the Yokohama Electric Wire Works, Limited, of Yokohama, which was organized in 1895 with a capitalization of $100,000 by five prominent Japanese business men of that city. Under the expert direction of German, English and American engineers the business has made remarkable growth and the works have undergone successive enlargements, despite serious fires in 1907 and 1912. In 1908 the firm became heavily interested financially in the Furukawa Copper Co., from which it had been buying its copper wire. The main works of the company are situated at Ura-Takashimacho, Yokohama, and there is an Osaka branch. All told, there are some five acres or more of buildings comprising one of the large insulated wire works of the world with an extensive business at home and a large export trade in the Orient and Oceania.

Rubber Plants at Kobe

A little after the Russo-Japanese war, English capital became interested in the Japanese rubber trade, and the Dunlop Rubber Co., Far East, Limited, was organized in 1907. At first it imported rubber goods from the Dunlop company in England and J. G. Ingram & Son, of London, but after the revision of the customs tariff in 1911 established a tire and tube factory at Kobe. In 1917, owing to financial difficulties, the firm was placed in voluntary liquidation for the purpose of transferring the business to a new corporation under the style of the Dunlop Rubber Co., Limited, Corporation to take over all assets and liabilities of the

old company and continue under the same management. Over 500 hands are employed.

The Ingram Rubber Manufacturing Co. was also established at Kobe by the son of Arthur Ingram for the manufacture of rubber goods, especially druggists' sundries.

Numerous native Japanese rubber companies have been organized in the Kobe district. One of the pioneers was K. Suzuki, founder of the Suzuki Rubber Co.

The Osaka Industry

The Osaka rubber industry began in 1887 with the making of hot water bags by K. Yoshida and his associates. In 1917 there were 58 factories employing 416 men and 355 women. One of the largest of these is the Kakuichi Rubber Co., Limited, which was established in 1906 as the Kakuichi Rubber Works and in 1910 registered as a limited partnership with a capital of $100,000. Messrs. Kinjino and Ilikotaro Abe, belonging to one of the wealthiest Osaka families, are the owners. The plant was enlarged in 1917 and is equipped with American and English machinery for the manufacture of rubber rolls, plates, tubes, ebonite, tires, mechanicals, surgical and electrical goods.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(257) A subscriber desires to get in touch with manufacturers who can supply 1,000 dozen, or more, rubber aprons, with bib, each month, for $2.00 per dozen, to retail at 25 cents each.

(258) We are asked for names of companies supplying machinery for making tire rims.

(259) Correspondent desires information as to sources of supply of 5/16-inch calendered sheet stock that will take a high "polish and buff finish."

(260) Inquiry is made for address of the American Barytes Corporation.

(261) Address is desired of manufacturer of hard rubber pillow vents.

(262) Exporter wishes to locate the manufacturer of "Tiger's Paw" brand of rubber heels.

(263) We are asked for addresses of manufacturers of men's rubber belts with or without buckles.

(264) A subscriber desires addresses of principal suppliers of titanium dioxide.

(265) Addresses are desired of firms manufacturing a machine for rolling tape on paper shells.

(266) We are asked for addresses of several companies selling black ozokerite.

(267) A resident of Calcutta, India, desires to find a market in the United States for about 1,000 tons of rubber scrap, which is ready for immediate shipment.

(268) We are asked for addresses of makers of hard rubber tubing.

(269) A subscriber asks the address of the manufacturer of Solvay brand of sal soda and caustic soda.

(270) We are asked for addresses of equipment manufacturers who can supply machines and appliances necessary for tube manufacture.

(271) A list is asked for of manufacturers in the east who make a specialty of small molded sponge rubber products.

(272) Addresses are desired of manufacturers of rubber gloves and aprons and also of vulcanized rubber rods ½ and ¾ inch in diameter, of various lengths.

(273) A subscriber inquires for source of supply of ground red slate.

(274) An osteopath is interested in a rubber air mattress which would be useful on the operating table.

(275) We are asked for addresses of manufacturers of hard rubber boning for corsets.

(276) Inquiry is made for sources of supply of hydrated lime suitable for use in the rubber industry.

(277) From England comes an inquiry concerning surgeons' rubber gloves, in smooth or rough, for wholesale trade only.

(278) A prospective manufacturer of hollow rubber goods, such as dolls and balls, asks for names and addresses of firms supplying the necessary machinery.

(279) Information is requested concerning the manufacture and marketing of dipped goods, such as surgeons' gloves, finger cots, toy balloons, etc., and sources of supply of equipment for manufacturing such goods.

(280) We are asked for a list of manufacturers of rubber bands.

Foreign Trade Opportunities

Address and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
7576	Netherlands—Toys	Agency
7579	Italy—Bathing caps	Agency
7586	Belgium—Waste rubber, especially inner tubes	Purchase
7587	Esthonia—Automobile tires	Agency
7594	China—Bathing caps	Purchase
7595	Germany—Rubber heels, with leather piece in center if possible	Purchase
7612	Canada—Rubber sundries	Agency
7626	Yugoslavia—Automobile tires	Purchase and Agency
7675	Mexico—Mechanical rubber goods	Agency
7683	Brazil—Automobile tires	Agency
7685	Algeria—Automobile tires	Purchase and Agency
7692	South Africa—Rubber washers, brass bound, for use in taps	Purchase and Agency
7693	Poland—automobile casings and inner tubes, and tire repair materials	Agency
7746	Ireland—Garden hose, surgical goods, wearing apparel, toys and novelties	Purchase and Agency
7762	Sweden—Thin rubber light-weight raincoats; also hard rubber for telephones and radio apparatus	Agency
7776	South Africa—Automobile and motorcycle tires	Agency
7787	Sweden—Mechanical rubber goods	Purchase

Foreign Tariffs

The Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., has recently issued the following special circulars regarding foreign customs tariffs:

Circular No.	Country	Articles
246	Costa Rica	Rubber Goods
268	Azores and Madeira Islands	Rubber Goods
269	Lithuania	Rubber Goods
270	Greece	Rubber Goods
271	Turkey	Rubber Goods
273	Latvia	Rubber Goods
274	Bulgaria	Rubber Goods

Further particulars may be obtained from the Foreign Trade Bureau of THE INDIA RUBBER WORLD, 25 W. 45th street, New York, N. Y.

SWITZERLAND, ORDINARY BUYING INCONSPICUOUS QUANTITIES of our rubber shoes, led other countries in July, 1923, in an importation of 27,211 pairs of such shoes, valued at $19,424.

Industrial Possibilities of Rubber Latex[1]

Brief History—Uses of Latex—Fabric Impregnation—Spray Dried Latex—Paper and Latex—Further Uses

IN the two preceding articles[2] a general description was given of the physical and chemical properties of rubber latex and a few of the fundamental facts which must be understood for its successful industrial use. This article will outline the present commercial uses of latex, and, at the same time, hazard some guesses as to probable future developments of this interesting material. Such suggestions are, of necessity, rather unsatisfactory, but the experiments made with latex, and the knowledge gained concerning its fundamental properties, confirm the belief in two directions. First, that there is almost no branch in the present manufacture of rubber goods where latex will not eventually be used to great advantage; secondly, that through the use of latex it will be possible to introduce rubber into many articles and processes where it has never hitherto been used. The successful development of latex in both these directions will probably require considerable time and must undoubtedly be preceded by a vast amount of detailed study and research work.

A superficial knowledge of latex, considering it merely as an exceedingly fluid colloidal solution of rubber in water, containing from 30 to 40 per cent of rubber, at once suggests countless applications where it apparently could be readily used. However, when tests are made, unexpected difficulties almost invariably arise. It soon becomes evident that without a thorough knowledge of the colloidal properties of latex and how these can be controlled and modified there is little hope of the development of wide industrial uses of the material. Many concerns have enthusiastically tried latex in some process and have emphatically pronounced it worthless when it unexpectedly coagulated, failed to penetrate, or otherwise misbehaved. It is safe to say that these difficulties will be encountered in the vast majority of new uses to which latex is put, but in the greater part of these a thorough study will show remedies for the difficulties.

A Little History

Before going into the present industrial status of latex it might be well to take a brief glance at the historical aspect of its use. Contrary to the belief in many quarters, the use of latex is not new, but probably even antedates that of crude rubber. The natives of South America have used it for centuries for waterproofing fabrics. It is interesting to note in A. Dubosc's "Historie de le Caoutchouc et la Gutta Percha," that Charles de Condamine exploring in Peru in 1736 wrote to the Paris Academy of Science describing this process. For some time at least, these natives have introduced sulphur into the latex to get a slow vulcanization in their latex treated fabrics. In 1911, H. C. Pearson in "In the Rubber Country of the Amazon" states that the natives stir sulphur into latex and then brush this with a feather onto fabrics stretched over a frame. It is interesting to note that Castilloa latex is preferred to Hevea for this purpose. Recently Stevens has analyzed the rubber layer of such fabric from South America and found it to contain 1.57 per cent of total sulphur and 0.9 per cent of bound sulphur.

Nor was the use of latex overlooked in civilized countries at an early date. In 1824 Thomas Hancock, in England, started work on rubber latex and took out three patents. In 1824 he patented it for making artificial leather; in 1825 he patented a process utilizing it in the rope industry, and again in 1833 for impregnating purposes in the manufacture of garments. However, his source of supply was uncertain, transportation was expensive and difficult and much of his material arrived coagulated, and he eventually abandoned its use. From this date on, latex was largely forgotten and the ground work of the present rubber industry, utilizing crude rubber and rubber solutions in organic solvents, was laid.

It is interesting to note that the fundamental methods of spreading, calendering, and vulcanizing, as started by Hancock, Goodyear and their contemporaries, has come down to the present day almost unchanged, except for the use of accelerators in vulcanization. It would seem, therefore, that the progress in the industry would now come by reverting to the earliest methods of rubber application, and developing them in the light of modern methods and recent developments of chemistry.

The literature on the subject of industrial development of latex is extremely meagre and the patent reports are equally scant. Undoubtedly much is being done which will appear when the patent office has acted on pending application. At present the outstanding patents that have been issued, dealing with latex are:

PATENT NO.		INVENTOR	SUBJECT
1,423,525	(United States)	E. Hopkinson	Spray dried latex
1,423,526	(United States)	E. Hopkinson	Spray dried latex
1,424,020	(United States)	E. Hopkinson	Cord fabric impregnation
1.437,487	(United States)	A. Biddle	Casein and latex
1,443,149	(United States)	P. Schidrowitz	Vulcanized latex
167,935	(British)	F. Kaye	Latex and paper pulp

Uses of Latex

The use of latex in the rubber industry divides itself naturally into two general classes. First: As latex, or in the partially coagulated form for impregnating or skim coating fabrics, substituting the customary rubber solution and calender; secondly, spray drying latex to obtain rubber which is very easily manipulated. By this process, a dry compounded rubber can be obtained without milling. The manufacture of weftless cord fabric by passing the cords through latex then laying them together in parallel, producing a continuous web, is an illustration of the first process, and the large scale commercial spray drying of latex, of the second.

Fabric Impregnation

For the impregnation of fabrics, rubber latex has certain obvious advantages. The extremely high rubber content for a given viscosity is one of the most outstanding, as the accompanying table will show:

Concentration Per Cent	Benzol rubber (Benzol = 1)	Latex Water = 1
35	...	9.1
20	...	2.8
10	...	1.5
5	137	1.2
2.5	19	1.14
1	4	1.02

The above was determined by the Netherlands Rubber Institute at Delft, Holland.

Further, the elimination of organic solvents removes a source of expense, danger to the workmen, and fire risk. Finally, with sufficiently finely divided or colloidal fillers, the rubber may be compounded by merely stirring these into the latex, the use of milling being eliminated. On the other hand, there is one point which should be clearly borne in mind. The latex contains individual particles of rubber of a size varying from 0.1 to 2.0 microns, whereas the rubber particles in an organic solvent are far below anything that can be observed with a microscope. It is, therefore, obvious that latex rubber particles will not penetrate

[1] Courtesy of F. K. Henderson & Co., Inc., New York, N. Y.

[2] THE INDIA RUBBER WORLD, August 1, 1923, 703-6, September 1, 1923, 763-5.

anything that is not sufficiently porous to have openings larger than the size of the rubber particles. A further difficulty encountered is that the electrical charge on the rubber particles of latex appears to be similar to that of cellulose when immersed in latex. At all events, whatever the cause, the rubber particles appear to be repelled rather than attracted by the cellulose fiber. This can be readily observed by examining under the microscope a cellulose fiber immersed in a very dilute latex (see previous article). It is further borne out by the difficulty of obtaining complete impregnation of canvas or duck. Even prolonged immersion of belt duck in latex of any concentration with the use of alternate vacuum and pressure fails to give more than a surface coating of the large strands, and if these are unraveled it will be found that very little rubber has penetrated inside of them. For many purposes, of course, a penetration of this degree is all that is required, but where an extreme degree of penetration is required, simple immersion in latex will not suffice. Further work on the modification of charges or surface tension will doubtless lead to great improvements in this direction. Where the fabric is not too closely woven, the use of a very slightly agglutinated latex gives a far greater absorption of the rubber particles than if latex alone is used.

Spray Drying

Spray drying of latex is at present being commercially carried on by two methods: first, that of E. Hopkinson, and secondly, that of A. G. Krause. The Krause process was patented in 1912 and the patent rights have passed to Metallbank and Metallurgische Gesellschaft, a German concern. It consists of running a liquid onto the periphery of a rapidly rotating disk which throws the liquid in a fine spray into a current of hot air. This carries off the water and leaves the solid matter in a collecting chamber. A description of the Hopkinson process was published in this journal several months ago.[3]

The advantages claimed for spray dried rubber are greater uniformity, better quality, and better yields. It appears very probable that greater uniformity might be obtained in this way, although experience would alone answer this question. The better quality of spray dried rubber as compared to a high-grade crêpe appears open to question. Such experiments as have been published have indicated no increase in tensile strength. The increase in yield amounts to about 10 per cent, but this is almost wholly if not entirely non-rubber impurities which are ordinarily washed away in the serum. The outstanding advantages in this process appear to be the possibility of spraying the compounding ingredients along with the latex so as to obtain a dried compounded rubber without milling, and the fact that this spray dried rubber softens more easily on the rolls than ordinary crude rubber.

Latex in Paper

The use of latex as a beater size in the paper making has been patented by F. Kaye.[4] According to the claims of this patent, latex in percentages as low as from 0.1 to 2 per cent added to the beater before the addition of the alum gives remarkable results as regards increase in tensile strength, folding tests and pop tests. Although the distribution of rubber in such an attenuated film as must result here would appear liable to rapid oxidation and deterioration, Mr. Kaye claims that this oxidation does not take place. Samples of latex were submitted to a number of paper manufacturers for experiments and the authors have also investigated this process. In all cases the latex was in proper condition and free from coagulation. None of the paper manufacturers have reported favorably and the authors were entirely unable to duplicate Mr. Kaye's great increase in tensile strength and pop test with the small proportions of rubber that he claimed were effective. With percentages as high as from 10 to 30 per cent a marked improvement was obtained, but in no case was this sufficient to jutify the cost of the latex used except for highly specialized purposes.

A recent article[5] on experiments made by the Bureau of Standards with Mr. Kaye's process states that they also were unable to obtain the results claimed by him with such small quantities of rubber. They also state that the rubber contained in this paper is quite sensitive to oxidation. It would, therefore, appear to us that the field for latex in the paper industry will be limited to special papers such as insulating papers or other specialties of that type.

We have also experimented at some length with the idea of using latex in the top sizing of paper. Here again it is necessary to use rather high percentages of rubber to obtain marked effects. Rubber alone is too elastic for the maximum increase in tensile and pop tests and a far greater increase in these tests can be obtained with a mixture of rubber latex and some stiffening substance such as casein, glue or similar materials. In this way the strength of the paper can be greatly increased without rendering it brittle as is the case where too heavy a size of casein alone is used. This treatment of paper would also appear to be applicable only in the manufacture of specialties.

Further Uses of Latex

It is obvious that a strong aqueous solution of rubber such as in rubber latex affords possibilities in processes and with materials where rubber benzol and crude rubber could not be utilized. The ideas mentioned below are the impressions gained from preliminary experimentation and are in no wise intended to be conclusive or final.

The use of latex as a means of carrying rubber into leather has been experimented with and appears to offer some interest. The greatest difficulty is that of penetration of the rubber particles into the leather and that of coagulation caused by the comparatively low pH of many leathers.

Another field that contains great promise is that of the manufacture of molded articles by means of latex. A variety of latex compositions have been made on a laboratory scale which appeared to offer interesting commercial possibilities in the field of plastics.

Another interesting field for latex appears to lie in its mixture with soluble celluloses such as viscose. Experiments with mixtures of viscose and latex disclose that the addition of rubber in this form renders the viscose flexible and also increases its water resistance. It would appear that this viscose latex mixture might have a variety of commercial uses. Similarly, latex can be mixed with glue, starch, etc., to increase the flexibility of these materials and at the same time add to their water resistance. The use of latex in this direction would probably be limited by its cost to very special purposes.

The use of latex in the preparation of cold water paints has been suggested but here again the matter of cost would appear rather extreme and furthermore the laying of rubber in such a thin film for a purpose where permanent strength is desired always brings up the question of oxidation.

These are only indicated fields of possible use and there are doubtless many others. In all of them, however, it is not a question of simply using latex and arriving at an immediate solution. Each industry has its own problems in the use of latex and research will be necessary before satisfactory results can be obtained, and many batches will suddenly coagulate at unexpected moments before the proper method of control is worked out. Of one thing, however, we are firmly convinced,— that the future progress of the rubber industry lies in the field of latex.

[3] THE INDIA RUBBER WORLD, June 1, 1923, 553-4.
[4] British patent No. 167,935.
[5] THE INDIA RUBBER WORLD, June 1, 1923, 561-2.

UNITED STATES EXPORTS OF MECHANICAL RUBBER GOODS continue increasing, shipments from January-June, 1923, reaching the value of $2,153,883, as compared with only $1,306,597 for the corresponding six months period of 1922, or with the total for the entire year of 1922, estimated at $3,154,627.

Compounding Properties of Tetra-Methyl-Thiuram-Disulphide[1]

Use with Bright Colors—Curing at Low Temperatures—Effect of Softeners—Heat Resistant Action—Cumulative Action with Other Accelerators

THE so-called "Ultra" accelerators first came into experimental use about five years ago. Their use commercially is now a reality and tetra-methyl-thiuram-disulphide is undoubtedly the most attractive one known. One's first experiments with it are liable to be misleading for the reason that the experimenter in order to get the full advantages of the material must use less sulphur, less accelerator, lower temperature, and a shorter curing time than he is accustomed to do. As is the case with most accelerators, the use of zinc is necessary in order to obtain greatest benefits.

Specially oxidized metallic salts of compounds from which the thiuram-disulphide is derived are also well known for use in particular pieces of work. The zinc salt compound is the most active and is accordingly used in cements and air curing spreader stocks. The lead salt compound is milder in its action and is unique in that it is activated by litharge and accordingly finds its place in litharge stocks, such as footwear, insulated wire, carriage cloth, heels, and general mechanicals, as well as some parts of tires.

Advantageous Use with Bright Colors

One of the earliest uses of the tetra-methyl-thiuram-disulphide was in bright-colored goods along with the organic dyes being developed in America at that time. In the earlier stages of the development of colors for use in hot cured goods, many of the colors would not stand long heating at high temperatures. It was an advantage to use a quick, low temperature curing accelerator with such colors. In the last two or three years the stability of these colors has been greatly improved. Today Europeans are coming here to buy colors for use in rubber, as American colors have been found to be the best in the world. Tetra-methyl-thiuram-disulphide is coming to be the popular accelerator for use with these colors. Even brilliantly colored heels in red, blue, and green, to match women's shoes, are being made with these colors and this accelerator.

Dipped and spread goods that were formerly acid cured are now being heat cured by means of the accelerator and the aging quality of the goods is greatly improved.

The tendency to use organic colors instead of antimony in automobile inner tubes has made another big field for this accelerator. A sample base stock for such an article is about as follows:

Rubber	100
Zinc oxide	3
Sulphur	1½
Softener	1½
Thiuram disulphide	¼

Such a stock takes any of the good colors readily and when wrapped on a mandrel and cured about thirty minutes at 20 pounds steam pressure gives a tensile strength of about 3,000 pounds per square inch and an elongation at break of approximately 800 per cent.

Short Curing Time

When it is especially desired to increase production from a limited number of molds or presses, the cure on many articles may be made as short as five minutes, though this very short cure is hardly to be recommended as molds cannot be handled efficiently in such short period heats. On large articles, when some time must be allowed for the heat to penetrate, the compounding may be done so as to extend the time of cure without overcuring the surface. This is best done by controlling the percentage of sulphur present.

Low Curing Temperature Possible

Also, it is especially worthy of note that the thiuram disulphide acts nearly as readily at 20 pounds as it does at 40 pounds steam pressure and in addition produces a better finished article, for the reason that the rubber has not been subjected to the deteriorating influence of so severe a heat treatment. It is quite natural that when using such a powerful, quick acting, low temperature accelerator there is difficulty on account of scorching unless the milling or compounding is arranged to eliminate such trouble.

It has recently been emphasized by Dr. E. B. Spear before the Milwaukee meeting of the Rubber Section of the American Chemical Society that over-milling has a very bad effect on rubber. It so happens that the remedy for over-milling and for scorching is one and the same: namely, the use of softeners with the crude rubber.

The Use of Softeners

The accompanying table shows the effect of about twenty well-known softeners when used in a type compound cured with thiuram disulphide. In order to show extreme effects, the softeners have been used in amounts of 2 and 5 per cent on the rubber. It is doubtful, of course, if any manufacturer would use some of these softeners in such amounts as 5 per cent, but it is also just as certain that some of these softeners may be used advantageously in certain high class goods, even to the amount of 10 per cent on the rubber. The time in minutes required to mill the softeners into the rubber is shown, also the tensile and percentage elongation at break when the stocks were cured 15 and 30 minutes at 20 pounds steam pressure in a laboratory slab mold. Similar tests were made in a so-called control batch which does not contain any softener and from this some conclusions may be drawn regarding the accelerating or retarding effect of different materials used as softeners.

The relative softening action of these different materials on the uncured rubber as estimated by different operators, the relative discoloring and the tendency of the softener to bloom or exude in the cured stock are also tabulated. The test compound is as follows:

Rubber	100
Zinc oxide	5
Sulphur	4
Thiuram disulphide	¼

Cured at 20 pounds steam pressure in mold

	15 min.	30 min.
Breaking tensile and elongation	3,700—800%	4,100—790%

If either 2 or 5 per cent of any of the following softeners be added to the rubber in the above compound, the effect on the physical tests is shown in the table on the following page.

[1]For the test figures and much of the technical data we are indebted to Dr. A. A. Somerville, vice president of the R. T. Vanderbilt Co., New York, N. Y.

EFFECT OF SOFTENERS IN TYPICAL COMPOUND CURED WITH THIURAM DISULPHIDE

	2 Per cent softener				5 Per cent softener			
	15 min.		30 min.		15 min.		30 min.	
	Ten.	El. %	Ten.	El. %	Ten.	El. %	Ten.	El. %
Aniline	4800	800	4500	740	4600	790	4400	760
Castor oil	3480	865	4000	815	2800	760	3700	780
Cocoanut	3450	850	4080	820	3250	860	3870	800
Corn oil	3600	790	4040	760	3260	830	3850	750
Cottonseed	2800	800	3800	790	2600	820	3600	800
Cresol	3650	800	3700	865	3375	825	4000	840
Cumar	3300	800	4250	810	3100	850	3950	800
Degras	3900	875	3830	805	3450	865	3750	815
Halowax (1000)	3530	870	3940	800	3300	870	3500	790
Hardwood pitch	3300	865	3800	800	3300	880	3440	790
Lead oleate	400	930	3050	820	580	970	1160	840
Mineral oil	3700	760	4120	725	3850	840	3900	760
Naphthalene	3620	850	3860	780	3650	855	4080	795
Oleic acid	4100	770	4250	720	3600	780	4000	755
Palm oil	3650	880	4200	780	3450	870	4100	800
Parra M.R.	3650	850	4150	795	3800	900	4000	815
Petrolatum	3520	840	4200	785	3420	900	3980	830
Pine tar	3700	840	4050	785	3500	870	3740	800
Rubber resin	3800	785	3950	770	3600	830	4000	770
Solvent naphtha	3600	750	4200	745	3250	840	3900	750
Spermaceti	3200	790	4200	755	3130	805	4010	755
Stearic acid	3900	835	3820	745	3700	835	3780	755
Sweet wax	4100	850	3950	790	3930	865	4350	790

	Mixing Time (Minutes)		Softening Effect	Discoloration	Exudation
	2 per cent	5 per cent			
Aniline	3	7	2	0	0
Castor oil	8	46	5	0	1
Cocoanut oil	2	6	4	0	1
Corn oil	3	7	3	0	1
Cottonseed oil	3	7	3	0	1
Cresol	3	6	1	1	0
Cumar	2	5	4	3	0
Degras	4	11	6	2	0
Halowax (1000)	1	3	4	0	0
Hardwood pitch	2	3	3	6	0
Lead oleate	4	5	4	5	0
Mineral oil	4	8	4	1	3
Naphthalene	1	2	4	0	1
Oleic acid	6	8	4	0	0
Palm oil	2	7	6	1	1
Parra M.R. flux	1	4	5	5	0
Petrolatum	4	9	5	1	2
Pine tar	2	6	7	7	0
Rubber resin	1	3	4	2	0
Solvent naphtha	3	6	7	0	0
Spermaceti	2	7	3	0	1
Stearic acid	3	5	4	0	1
Sweet wax	3	8	5	1	4

Fire-Proof Compounds

For some time there was a general idea that these ultra accelerators could be used only for very short cures, that they have only a short curing range and overcure badly. Nothing could be farther from the facts if thiuram disulphide is properly compounded. The use of this material makes possible compounds of probably the widest curing range known and accordingly the most desirable material to use in stocks where first cost is not so important as the life of the article itself when it is subjected to constant or repeated heating, as is the case of brake lining, high pressure sheet packing, water-bottles, nursing nipples, also surgeons' gloves (sterilized), conveyor belts for carrying hot materials and air bags for use in curing cord tires.

In order to make heat resistant or "fire-proof" compounds it is only necessary to reduce the sulphur in the compound to a very small amount and increase the amount of thiuram disulphide used in order to obtain a good cure in either ten minutes' or ten hours' time at the normal curing temperature corresponding to 40 pounds steam pressure in a press. A few such compounds as are suitable for extremely long life air bags, together with their curing range in a flat slab mold, are here shown:

	A	B	C	D
Rubber	100	100	100	100
Zinc	100	10	10	15
Gas black	...	15	..	25
Dixie clay	35	35	60	20
Pine tar	...	5	5	5
Sulphur	¾	½	¼	½
Thiuram disulphide	3	2	2	2

Cured at 40 pounds steam pressure in a mold

	10 min.		60 min.		120 min.		600 min.	
	Ten.	El. %	Ten.	El. %	Ten.	El. %	Ten.	El. %
A	2900	470	2870	470	2900	485	2790	480
B	3560	550	3350	535	3270	535	3360	515
C	3210	555	3050	530	3020	545	3090	550
D	4100	585	3550	520	3725	520	3700	510

It should be noted that if the air bag stock contains litharge and thiuram disulphide it will not cure at all on account of the reaction between these two materials. Likewise, if a litharge cement is used to paint the air bag or the inside of the tire to be cured, that litharge cement will prevent the passage of the thiuram disulphide from the bag to the tire while the tire is being cured and will also tend to prevent much of the sulphur passing from the tire to the air bag. On account of the absorption of the thiuram disulphide in the air bag by the litharge cement which may be used as a protective coating, it may be desirable to use as much as 3 to 5 per cent of thiuram disulphide on the rubber content in the air bag and thereby prolong the life of the bag almost indefinitely.

Cumulative Action with Other Accelerators

It is well known that some combinations of two or more accelerators can be used to good advantage. It may have been noted above in the effect of softeners that aniline and thiuram disulphide are cooperative in their curing action. The thiuram disulphide may also be used to advantage with most of the better known accelerators, such as Hexa or D. P. G. Its action with ethylidine aniline is most striking. Such small amounts of either of these materials may be used separately in a compound as to give a slow or incomplete cure; but if the amount of each accelerator is halved and the two thrown together in one mix, a better and quicker cure is obtained than is the case when either one is used alone in double amount. As an illustration:

	A	B	C
Rubber	100	100	100
Zinc oxide	5	5	5
Sulphur	3	3	3
Softener	4	4	4
Thiuram disulphide	½	..	¼
E. A.	..	½	¼

Cured at 20 pounds pressure

	10 min.		15 min.		30 min.		45 min.	
	Ten.	El. %	Ten.	El. %	Ten.	El. %	Ten.	El. %
A	Did not cure		2200	900	3300	880	3340	860
B	Did not cure		1290	990	1805	940	2230	930
C	3060	890	3125	880	3685	835	3980	810

High Tensiles

Where it is desirable to obtain extremely high tensile strengths, such is possible by the proper adjustment of the accelerators. For this purpose a mixture of mineral oil, sweet wax, and aniline is favored as the best softener to prevent over milling and scorching. The regular commercial zinc oxide may be used, but of course the best grade of rubber is quite desirable. One illustration is sufficient:

Rubber	100
Zinc	5
Softener	4
Sulphur	2
Thiuram disulphide	¼
E. A.	½

Cure at 20 pounds steam

10 min.		15 min.		30 min.	
Ten.	El. %	Ten.	El. %	Ten.	El. %
5200	735	5300	745	5100	725

By using the finer grades of zinc and 1 to 3 per cent of gas black, it is quite possible to approach 6,000 pounds tensiles in laboratory test batches.

The Value of Carbon Dioxide in Air Bags

Air Bag Oxidation—Effect on Stock—Migration of Sulphur—Cost and Life of Bags

By Henry R. Minor[1]

IN a preceding article[2] a description was given of the nature, manufacture, and manner of use of carbon dioxide in air bags. It was there brought out that lack of general information relative to the availability, price and means of distributing and using the gas in cylinders under pressure was chiefly accountable for carbon dioxide not being used more extensively. It was shown how this gas could be used either with bolted

Air Bags Averaging Twenty Pounds Rubber Scrapped Because Insides Are Charred

molds or with the constant pressure system, and illustrations were given of the method of application in each case.

The purpose of the present article is to make public for the first time the results of recent studies and commercial tests of the *value* of carbon dioxide as an inflating medium, and it is believed opens up a most important subject, as these results show rather startling facts.

Conditions vary so greatly in different rubber factories, both as to compounding, type of air bags used, time of vulcanization, normal life of bag, factors causing failure, etc., that no general deductions were possible except those founded on a broad field of operations. In the study of this subject the literature available has been consulted, laboratory experiments have been performed and numerous tests carried out in rubber factories on a few tires at a time. This article is based on the composite results obtained from eleven different factories, in each of which one heater was run entirely on carbon dioxide.

Effect on Oxidation

If it were necessary to use dry air as the inflating medium, the air-bag method of applying pressure would be commercially impractical because of the rapid oxidation of the rubber on the inside; however, by adding a small quantity of water the oxidation process is retarded and this latter method has been generally adopted. It should be here noted that the degree of oxidation varies greatly in different plants and is affected both by the presence of oil carried over from the compressor and by the amount of pressure applied.

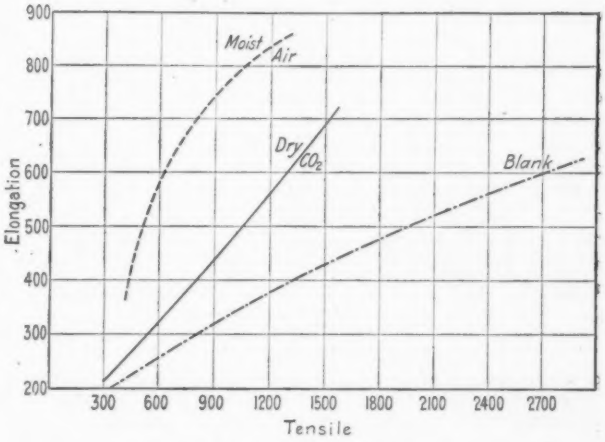
While the direct effects of oxidation on the inside of the bag in promoting failure are well known, due regard has not been given in the past to the indirect effects. When flexing occurs in a bag which has not been subjected to oxidation, one-half of the wall is in tension and the other half in compression. When, however, oxidation is present, the inner wall composed of hard particles acts as a pivotal point increasing the tension on the outside and tending to cause cracking there.

When carbon dioxide is used as the inflating medium, there is a marked absence of oxidation effects, both direct and indirect. The inner surfaces of the bags are smooth and like new, the gas is used dry and the labor of filling the bag with varying quantities of water is saved, incidentally resulting in the obtaining of more uniform pressures. There is reason to believe that CO_2 air bags could be reclaimed, thus utilizing the huge air bag scrap pile.

Effect on Stock

The stock in a bag is materially stronger when used with carbon dioxide than when used with moist air. Moisture in a bag softens the stock, decreases its strength and increases the elongation percentage. Comparative examinations of many types of bags have shown this to be almost universally true. Comparative results with moist air and carbon dioxide show that the gas-filled bag has less valve trouble, is far less subject to taking a set and buckling and averages about 40 per cent longer life.

The accompanying chart was plotted from tests on gum sectional air bags and shows the comparative effect of dry CO_2 *versus* moist air on the stock. The blank represents pieces taken from a bag cured two hours at 50 pounds pressure without further treatment. These curves clearly show the marked advantages of dry gas over a moist one as affecting the stock of the air bag. The tests were made after the outer surfaces had been buffed off.



Surface Test—CO_2 Compared with Air

Migration of Sulphur

Many bags are rendered unfit for service by a hardening and cracking on the outside which when expanded mars the inside of the tire. It is generally accepted that this is caused by a migration of sulphur from the carcass of the shoe to the bag. It has been noticed that in many cases this effect is materially lessened when carbon dioxide is used as the inflating medium. Especially has it been noted where the inner oxidation effects

[1] Development engineer, General Carbonic Co., New York, N. Y.
[2] THE INDIA RUBBER WORLD, March 1, 1923, p. 353-4.

are at a minimum, and the degree of improvement is too large to be attributable to the removal of the indirect effects of oxidation.

The illustration herewith shows typical surfaces of two bags used in the same factory, one with air and the other with carbon dioxide; each has gone its full life and while the gas bag has gone 40 per cent longer, the outside surface is in as good or better condition than the one used with air.

The action of carbon dioxide in protecting the outside of the bag is explained by the fact that CO_2 passes through rubber more rapidly than other gases, and this takes place through solution in the rubber itself with subsequent evaporation on the outside. Rubber is an excellent solvent for carbon dioxide and application of pressure materially increases the volume of gas contained. Rise of temperature increases the rate at which penetration of the rubber takes place.

The theory advanced to explain the protection given by carbon dioxide is that the particles of sulphur migrating from the carcass of the shoe to the bag become effectively isolated from

CO_2 INFLATED AIR INFLATED

Air Bags Used in Comparative Tests

the rubber of the bag by a gas film. As an analogy it is recalled that, whereas either ammonia or hydrochloric acid are readily soluble in water, when brought together forming a cloud of solid ammonium chloride particles solution becomes almost impossible due to the intervening gas film.

Factors that have been found to influence outside protection are the character of the paint used on the outside of the bag, the time of vulcanization and the thickness of the bag itself, all three acting in a manner that tends to confirm the theory advanced.

Cost and Life of Bag

The life of an air bag on the smaller sizes varies from twenty cures to upward of one hundred. Cures in excess of fifty are obtained by using a heavy gum bag, buffing off the outside and retreading. Many manufacturers compliment themselves on the record made in this respect, yet some who do not retread are undoubtedly operating at a lower cost per tire per cure than their competitors who are obtaining twice the number of heats. Regarding the best method it would appear that there is a slight advantage to be obtained by retreading.

By the use of carbon dioxide savings of from one to three cents per tire per cure are effected, and the life of the bag is prolonged an average of forty per cent. Particular attention should be called to the fact that when retreading is adopted a heavy bag is necessary due to the cumulative effect of oxidation. This is not required with CO_2, and considering that the conductivity of a body varies inversely as its thickness and that the conductivity of rubber is particularly low, it follows that better thermal conditions must obtain.

Leakage in Heaters

With the bolted mold system there is little or no loss from leakage or air or gas into the vulcanizing oven. With the constant pressure system this leakage varies from a quarter of a pound per tire per cure or less (a negligible quantity) up to as high as two pounds per tire per cure over a period of one and one-half hours. Excessive leakage is due to antiquated equipment, worn connections, or carelessness on the part of operators, and does not seem to have received the attention it merits.

Mixing air with steam affects the transfer of heat from steam to the molds, due to the formation of an air film on the surface of the molds. This film being an exceedingly poor heat conductor varies the heat transfer rate, and thus the cure, according as the percentage of air present is large or small.

Another disadvantage of leaky connections inside the heater is that when temperature control is used the pressure will gradually build up, necessitating a higher setting of the pop safety valve if the heater will stand it, or a frequent blowing off of the valve if a low pressure is maintained, resulting in loss of steam, noise, and poorer working conditions.

With carbon dioxide it becomes necessary to keep this leakage down in order to avoid loss of gas so that its economic use is in itself an assurance that the above objectionable conditions do not exist.

The following table gives the pounds of carbon dioxide required and resulting pressure.

Shoe Size	Initial Pressure 125# Temp. 70° F. Pounds CO_2	Pressure at 282° F.	Initial Pressure 175# Temp. 70° F. Pounds CO_2	Pressure at 282° F.
30 x 3½	.25	175#	.32	245#
31 x 4	.32	175	.47	245
32 x 4½	.44	175	.64	245
33 x 5	.67	175	.98	245

Summary

In summarizing the use of carbon dioxide in air bags the following conclusions are drawn:

(1) It protects the bag from both direct and indirect effects of oxidation. (2) Being used dry it eliminates need of placing water in the bag, thus insuring more uniform pressures and cures. (3) Insures a stronger stock; set and buckling are reduced, valve replacements are fewer and a lighter bag may be used securing better heat transfer from the mold to the inside of the bag. Reclamation of the rubber bag may be possible. (4) Affords substantial protection to the outside of bag from migration of sulphur in many cases. (5) Adds an average of forty per cent to the life of an air bag and saves from one to three cents per tire per cure. This may be increased by using the recirculation system. (6) May be economically used with either the bolted mold or constant pressure system and in the latter case insures absence of objectionable features of leakage in heaters.

INCREASE IN EXPORTS OF AMERICAN RUBBER GOODS, JANUARY-JUNE

A comparison of our total export trade in rubber goods for the first six months of 1922 and 1923 is especially significant, as representing the steady development of the industry, notwithstanding the seasonal decline during April, May, and June. It will be noted that, during the 1923 period, shipments to each of the grand divisions have advanced in value, notably so in the case of South America, Oceania, and Europe.

UNITED STATES EXPORTS OF RUBBER GOODS

	January-June, 1922	January-June, 1923
Europe, total	$6,627,057	$7,939,969
North America, total	5,263,257	5,769,550
South America, total	2,011,063	3,248,628
Asia, total	1,323,145	1,980,377
Oceania, total	1,857,709	2,732,117
Africa, total	824,628	1,108,738
Grand totals	$17,906,859	$22,779,379

German Manufacture of Hollow Rubber Balls[1]

Stock Preparation—Assembling the Segments—Vulcanizing—Aging—Painting and Decorating

IT was not until about 1820 that rubber was utilized for the manufacture of toy balls. At that time the balls were, of course, made of uncured rubber, but soon after the discovery of vulcanization, vulcanized rubber was used for the purpose. Among the first German manufacturers to turn out toy balls were Albert Cohen, and Vaillant & Co., Harburg; Fonrobert and Reimann, Berlin; Herman Lerch, Moscow. The first two manufacturers exhibited rubber balls at the London Exhibition of 1862 and the last two at the exhibition of Russian manufacturers in 1870. After this, however, the production of balls progressed steadily and as early as 1878 molds were exhibited in Hannover and competition so forced down the price that the German manufacturers and wholesale dealers organized the so-called German Ball Conventions in which the foremost firms took part.

Preparing and Cutting Sheet Stock

In ball making it is necessary to have a good formula which will give a mix that is air-proof, soft and easy to mill, but firm and elastic after vulcanization. The mix is prepared as for other fine rubber goods and is allowed to stand for a few days. Then it is warmed and 30 to 50 per cent of waste from stamped sheet is added to make the sheets as soft as possible. The mix is sheeted and cut into strips of the right width on a three-roll calender. The cutting knives are attached to the third roll, which is kept cool to permit separation of the cut strips. The strips are then wound on wood reels which are placed in the stamping machine that cuts the strips into the desired shape and bevels the edges.

[1]Gummiwelt, March, 1922.

The cut pieces are placed on stands ready for the next step. The work so far described takes place without talc and must therefore be done very rapidly to prevent sticking. Women now take the pieces and place them in rows next to each other, beveled edge up, on a zinc top table.

Assembling the Segments

The segments are then painted with a thin but strongly adhesive benzol solution. Four segments go to make a ball and on the fourth segment belongs the plug for inflating the ball. Consequently every fourth row receives a plug of soft and elastic rubber about 1 cm. (.39-inch) long and with a diameter of 6-8 mm (.23 to .31-inch). The segments belonging to one ball are then assembled and the edges firmly pressed together. Before the ball, which is now square, is finally closed, it receives a small quantity of ammonium carbonate, which during vulcanization becomes a gas that presses the rubber against the mold, thus giving the ball its required shape.

Gummiwelt

Fig. 1—The Curing Room. Fig. 2—Discharging the Molds. Fig. 3—The Finishing Room.

The Curing Process

After the pieces have been put together they are well dusted with talc and are ready for the molds. These molds are in two parts which must fit accurately. They are soaped and dried, then the balls are put in in an upright position and the molds carefully locked. After vulcanization, the forms are cooled by admitting water into the kettles. When the molds are cool, the gas which has developed in the balls loses its power and the balls collapse so that they can easily be taken out. The gas

must now be removed. In some factories a hollow needle is stuck into the plug on top of the ball and the ball squeezed. In others, the gas is removed by vacuum pumps and the balls are inflated to the proper size by reversing the pressure.

Aging the Balls

The inflated balls are stored away until winter. The storage place should be dark and the balls turned from time to time. In April, the balls are taken out of their storage place to be finished. They are placed in large drums where they are polished smooth in a tumbling barrel with glass powder, pumice stone, etc., and water. The water is necessary to prevent overheating and consequent bursting. After the polishing process the balls are again inflated by means of a blowing needle. The holes thus formed are stopped with unvulcanized rubber thread about 2 mm. (.078-inch) thick dipped in benzine, turpentine, or the like; and the balls are ready for painting.

Painting and Decorating

First the balls receive a coat of lac (varnish) and are placed on boards with nails arranged so that the ball is supported at three points. Women paint the ball sections in the desired colors by hand and finish off with dark border lines by means of a special contrivance. This consists of a cast-iron plate with three points on which the ball rests. The plate is put in motion and a thin brush with dark paint held against the rotating ball. In large factories, a spray is used for painting instead of the brush.

A favorable method of decorating balls with pictures is by means of metachromatype. The fronts of these pictures are covered with varnish and placed, varnished side up, on warmed, fairly wet felt. The paper draws the water and the layer of glue between the paper and the impression is dissolved. If a ball is now softly pressed against the varnished side the impression separates from the paper and sticks to the ball. This work must be very carefully done if the picture is not to be spoiled. Of late, the finer kinds of picture decorations are applied by means of stenciling. The finishing process for all painted balls is a coat of elastic varnish.

Los Angeles-Catalina Rubber Insulated Cable

Two rubber-insulated single core submarine cables, said to be the first of their kind ever laid anywhere, now afford telephonic communication between San Pedro at Los Angeles harbor and Avalon on picturesque Catalina Island, twenty-five miles out on the Pacific. The cables were laid for the Pacific Telephone & Telegraph Co. by the United States Government cableship, "Dellwood." They were supplied by the Western Electric Co. from its works at Hawthorne, Illinois, and made according to specifications prepared by the American Telephone & Telegraph Co.

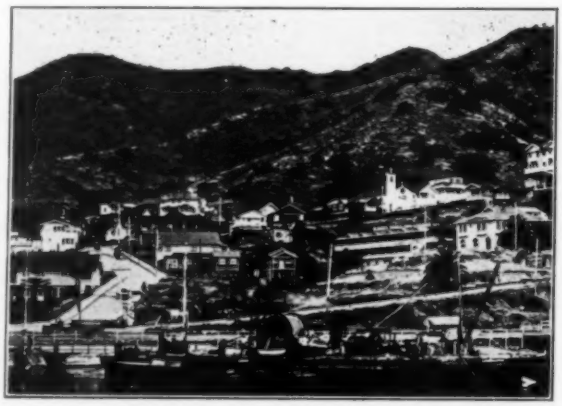
As telephone cables they are interesting inasmuch as, instead of using a great number of paper-insulated fine copper wires as conductors as in ordinary telephone cable, they have but a single conductor—a large, tinned copper wire—for a core with heavy vulcanized rubber insulation. Over this is a helical wrapping of copper tapes, tanned jute covering, armor of large galvanized steel wire spirally wound, and finally a layer of jute rope well tarred.

Each of these single core cables provides a telegraph circuit in addition to the telephone circuit. The telephone currents flow out through the insulated central conductor and return through the copper tapes outside of the insulation.

The total length of each cable, between the mainland and the island, is 23.7 nautical miles. Soundings made last year by the U. S. Coast and Geodetic Survey Steamer, "Pioneer," showed the maximum depth of the Catalina Island channel about 3,000 feet. The total weight of each cable is about 160 tons. The cables lie about two miles apart, although brought together at their termini.

Preparatory to providing telephone service for Catalina Island, which hitherto had to depend upon radio for messages, the telephone company laid the shore end sections of the two cables out from Avalon to the 100-fathom depth, about 2½ miles from shore, a specially-fitted barge, shown in the illustration, being used. The remainder of the cable was laid by the S. S. "Dellwood," starting at the San Pedro end and laying to the buoyed ends of the Catalina shore end sections, which were picked up and spliced to the cables from the mainland.

In each cable four splices were made, two while the cable was still on the cars and two at sea. Splicing, which on land ordinarily took five hours, was done on the ship in about four hours. After "stepping down" the cable ends, the two copper cores were



Laying the Los Angeles-Catalina Cable

soldered together and the copper joint was wrapped with vulcanizable rubber gum and cured. Next to this insulation the helical copper tapes were placed and the ends welded together. The jute cushion for the armor wires was then replaced, and the armor wires placed in position with an overlap of about 4 feet, the smaller wires being on the outside. The armor wires were electrically welded and finally a layer of jute yarn well coated with tar made the splice complete. So neatly was the work done that the hand-made splice was not much larger than the machine-made cable.

The cable-laying ship "Dellwood" registers 7,489 tons and is a United States Army transport maintained from the allowance for the quartermaster's department and the Seattle-Sitka cable service. Of the crew of 100, twenty well-trained Filipinos are the cable men, directed by a veteran cable engineer, Captain Henry Winter. The vessel, commanded by Captain Robert Shears, can carry in its hold 1,700 miles of deep-sea cable. On the forward deck is the cable "picking up" machine, and on the after deck is the "paying out" apparatus, which brings the cable up out of the hold, where it can be kept dampened in tanks, and pays it out so that it drops to the sea floor. The latter rigging is all new and was used for the first time on the job herein described.

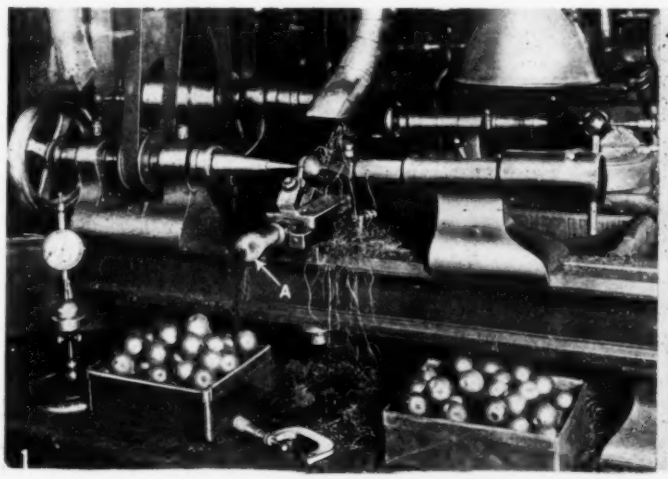
UNITED STATES LEADS IN NEW ZEALAND TIRE IMPORTS

During the year 1922 the United States exported to New Zealand automobile tires valued at $692,137, this representing over 43 per cent of the total value imported into that country. France supplied over 29 per cent as compared with 6 per cent from the United Kingdom, nearly 17 per cent from Canada, and about 7 per cent from Australia. In this connection it is interesting to note that during the first six months only of the present year the United States has already exported to New Zealand automobile tires valued at $700,701, representing a larger total than for the entire year 1922. Notwithstanding New Zealand tariff preferentials favoring imports from British possessions, the American product seems to be able to successfully compete in this branch of the rubber industry, as well as in certain others.

Machining Hard Rubber Balls and Disks for Water Meters[1]

Turning, Slotting and Testing Hard Rubber Balls—Facing the Hard Rubber Disks—Meter Case Assembly—Operating Principle

HARD rubber plays a prominent rôle in the construction of meter cases that are important parts of meters used for measuring water. A hard rubber ball forms the axis for the measuring ball and disk in the measuring chamber. Some of the balls may be seen in Fig. 1 which also shows the way in which they are turned between centers in a bench lathe. The rough balls are in the box at right, just as they come from the molds, while the finished balls are in the box at the left. There are, however, two turning operations, roughing and finishing, the latter cut merely removing any imperfections which may have been left by the roughing tool. Diamond cutting tools are used in both cases.



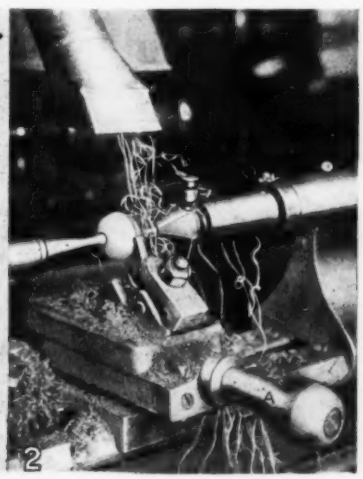
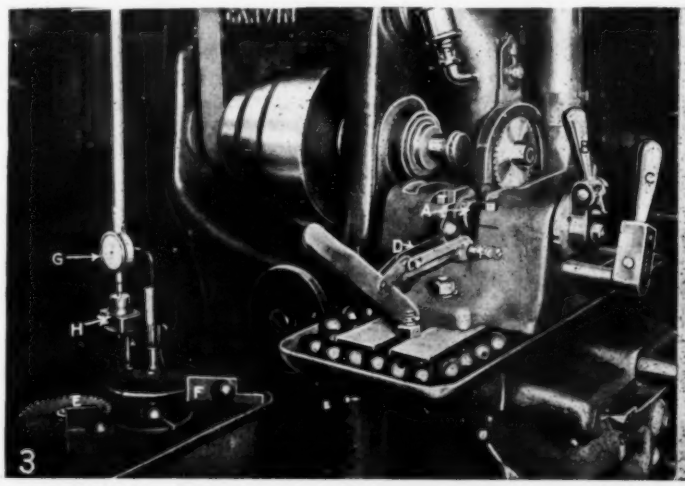


Fig. 1.—Turning Hard Rubber Balls. Fig. 2.—Details of Turning Tool.

Ball Turning

The ball is formed by swinging the tool around a center by means of the handle A, shown in both Figs. 1 and 2. The diameter of the ball is held within very close limits, as both balls and disk must work freely and without leakage. The balls are measured with the micrometer shown in Fig. 1 and also tested for both diameter and roundness by the dial gage to be seen in the illustration at the left. The ring of this gage supports the ball while being revolved under the pointer, and the dial gage shows any variations. Details of the tool and the lathe centers are shown in Fig. 2. It will be noted that there is an exhaust pipe directly over the turning tool and that the rubber chips are drawn up into this pipe as they come off. A few drop on the machine but



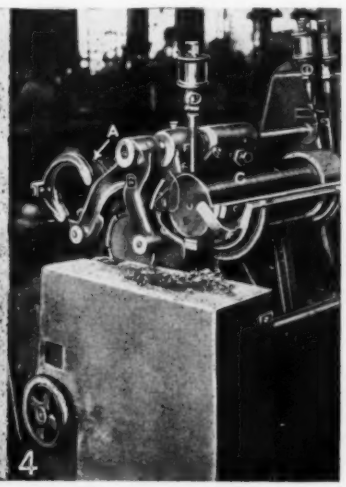


Fig. 3.—Slotting and Testing Balls. Fig. 4.—Facing Hard Rubber Disks.

[1] By Fred H. Colvin. Editor American Machinist. Issue of April 26, 1923.

the majority escape up the suction pipe together with most of the odor from the rubber.

Slotting the Ball

The balls are slotted on three sides to receive the disk plates and this is done in the Garvin milling machine shown in Fig. 3. The fixture shown on the table holds the ball while it is being slotted, and indexes it so that the three slots may be cut in proper relation to each other. The ball is held between two cupped plungers, one of which is seen at A. The indexing is done by the handle B, while handle C clamps and releases the ball. Before the last slot is cut, the slide D is pushed in under the ball for support. When the ball is released it is brought out on the slide as shown in the illustration.

Ball Testing

The gages used are shown at the left in Fig. 3. Gage E inspects the width of the slot while the one at F gages the thickness of the material left by the milling cutters. The relation of the slot to the outside of the ball is tested by the dial gage at G, the slot in the ball sliding over the wings H and under the cup above.

In testing for strength a hand lever press is used. The slotted ball is slipped over two plates, one being stationary while the other swings in a bearing. Pressure is then applied to the latter by means of the lever which twists the ball slightly and shows whether it has sufficient flexibility and strength.

Facing the Disks

The disk plates which carry the ball are cut from flat sheets and are then placed in the magazine of the machine shown in Fig. 4 at A. The forked arm B swings to the left and the disks in the magazine are pushed out so that the outer disk slips over a pin in the left arm. The arm then swings to the right and brings the disk in position for chucking. An inward movement places the disk in the chuck, which grips it, and the facing tool commences to travel across the face. The next movement of the feeding arm swings the finished disk up to the finished magazine C and at the same time picks a new disk from the rough magazine and places it in the chuck. Diamond tools are also used for this work, the cutting speed being in the neighborhood of 500 feet per minute. The disks go through this machine twice, to face both sides, and the thickness is held to very close limits.

Meter Case Assembly

After the disks are slotted and the ball assembled, bronze studs are forced into the center holes of the ball, which is then slipped into place in the disk. The assembly is then placed in the holder of a hand press, the plunger of which is lowered to hold the disk flat, and the spindle revolved. The spindle carries a hollow burnishing tool which fits down around the bronze stem and straightens it with relation to the disk so that it stands perfectly square.

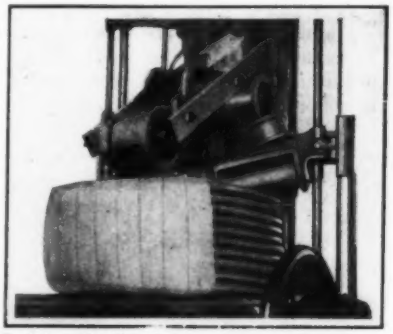
The triangular diaphragm which divides the measuring chamber into two parts is forced in with a small hand press. The piece is forced into one-half the case, which is turned upside down on the base and clamped by a single movement of a lever. The triangular piece is placed in the slot and forced in by a toggle at the back, worked by a lever until it touches the ball. Before putting the other half of the case into place the rubber disk, with its ball in the center, is placed in position and the two halves slipped together. The slit in the disk allows room for the triangular piece.

Principle of Meter Operation

In operation, the water enters at one side of the triangular diaphragm, forcing the rubber disk to move with a rotating motion with the ball as a center and causing the bronze spindle to revolve as a crank pin with relation to the ball center. This gives motion to the gear train and the register which records the amount of water passing through the meter. It is for this reason that the volume of the chamber must be kept as nearly correct as possible, as errors accumulate with every filling and emptying of the chamber.

Garden Hose in Bales Eliminates Reels

The introduction, many years ago of garden hose in 500 feet lengths required it to be wound on a wooden reel for shipment and to serve the dealer as a means of handling and measuring the hose. Now, by the use of an automatic machine which insures the accuracy of measurement, every length of braided and molded hose is marked by numbers one foot apart applied on the cover before encasement in lead for vulcanization. Thus every length is its own tape measure as uncoiled to fill an order.



Torkelsen Machine Co.

Hose Wrapping Machine

The hose is put up in bales which are first shaped on a revolving drum to convenient dimensions, according to size of hose, and

Measured Garden Hose

then tightly wrapped by a special machine with strip paper as is done with automobile tires.

This method eliminates costly wooden reels, prevents cuts and chafes from broken parts of reels, makes a lighter package, saves freight charges, storage space and prevents soiling the hose as the outer burlap covering remains in place until the goods are sold.

BRITISH RUBBER INDUSTRY IMPROVED

The reduction in London stocks of crude rubber from 73,361 tons on January 27 to 50,335 tons on July 7, and in Liverpool stocks from 8,782 tons in December, 1922, to 5,559 tons in June, 1923, is accounted for by the excess of exports over imports amounting to 8,846 tons in the first six months of 1923, and by the takings of British manufacturers, which amounted to 17,403 tons for six months or at a rate of about 35,000 tons per year, which is a very substantial improvement over their purchases for the two previous years (1920—25,000 tons; 1921—24,000 tons). It is not possible to estimate what percentage of this year's purchases is for future use, but the rising market undoubtedly caused considerable speculation.

The position of the British manufacturing industry has improved during the past six months particularly in the sale of hose and mechanical rubber goods. German makers of small rubber goods have been active in this market as heretofore and have caused some anxiety to British makers. There has been some improvement in the position of tire manufacturers, although competition from foreign manufacturers continues to be severe. According to the Board of Trade, 10.7 per cent of the workpeople in the industry were unemployed at the end of May, as compared with 13.1 per cent on December 18, 1922, indicating an improvement although the position seems still unsatisfactory for the industry as a whole.—Trade Commissioner Hugh D. Butler, in a report to the Department of Commerce.

Meeting of the Rubber Division American Chemical Society

THE sixty-sixth meeting of the American Chemical Society was held at Municipal Hall, Milwaukee, Wisconsin, September 10 to 14, 1923. The meeting of the Rubber Division took place on the 13th. The occasion drew an attendance of about 150 rubber chemists and technical men representing many of the smaller companies as well as the larger ones.

Election of Officers

This being the annual meeting, officers were elected for the ensuing year. The names of the officers chosen are as follows: Chairman, Ellwood B. Spear; vice chairman, C. R. Boggs; secretary-treasurer, A. H. Smith.

Executive Committee: chairman, Winfield Scott; W. B. Wiegand, Ira Williams, L. B. Sebrell, H. B. Pushee.

Committee Reports

The Executive Committee, the Trade Name Accelerator Committee, and the Committee on Originator of Organic Accelerators made no reports. The Crude Rubber Testing Committee made a report covering tentative standard test compounds and methods of testing. The report was adopted as tentative and ordered printed for distribution to the members of the Rubber Division for criticism and development pending revision and ultimate standardization. It is hoped that cooperation of American, European and Far Eastern rubber chemists in the study of the subject will ultimately result in standard testing procedure for every commercial grade of crude rubber.

The Physical Testing Committee, through its sub-committee on apparatus, reported comparative abrasive wear tests of the same stock on five different abrasive wear machines.

Abstracts of Papers

Laboratory Vulcanizer with Multiple Compartments. This paper describes a new vulcanizer designed to accurately determine the rate of cure of rubber compounds in air, inert gases, or steam at atmospheric or higher pressures. The apparatus consists of seven compartments arranged within a steel shell so that all are heated simultaneously by the same steam supply. The individual compartments are so arranged as to be loaded and discharged independently of each other. In any heat all of the compartments may be filled with the same atmosphere or groups of the compartments may be provided with different atmospheres.—A. G. Emery and W. H. Whitcomb.

Effect of Overmilling and Duration of Curing Time on the Quality of Rubber Compounds. Long milling in the presence of air, even at low temperatures, 50 degrees C., greatly deteriorates accelerated rubber stocks. Also, with varying amounts of accelerator, diphenylguanidine, the quality of the cured stock decreases as the time of cure becomes greater. The divergence of published opinion with regard to the effect of milling is attributable to great differences in curing time.—Ellwood B. Spear and Robert L. Moore.

The Acceleration of Vulcanization—I. Influence of the Non-Rubber Constituents on the Physical and Chemical Properties of Rubber Stocks. The resin acid content of rubber exerts a marked effect upon the physical properties of stocks containing carbo-sulphydryl accelerators, and also plays an important part in accelerating the rate of addition of sulphur. With the hydrogen sulphide polysulphide accelerators the action of the resin acids is almost entirely physical. A deficiency of resin acids gives stocks of low physical properties with little or no change in the rate of addition of sulphur. The importance of these acidic substances is perhaps too little appreciated as regards their effect upon the physical properties of many accelerated compounds.—L. B. Sebrell and W. W. Vogt.

The Acceleration of Vulcanization—II. The relation of structure to curing power.—L. B. Sebrell.

Comparison of Sprayed Rubber with Smoked Sheets in Commercial Truck Stock. Comparison of physical properties of two typical tire tread stocks containing relatively high percentages of carbon black and glue.—C. Olin North.

Proof That Diphenylguanidine Is a Hydrosulphide Accelerator. Three methods are conceivable for the explanation of the accelerating action of diphenylguanidine. (1) Diphenylguanidine may decompose under the conditions of vulcanization, the decomposition products thus formed functioning as the true accelerating agents. (2) Diphenylguanidine may form derivatives analogous to ammonium hydrosulphide, sulphide and polysulphides. The primary heat decomposition products of diphenylguanidine are aniline, phenylcyamide, ammonia and diphenylcarbimide. The secondary products are tetraphenylmelamine and triphenyldicarbimide. None of these substances either singly or collectively will produce acceleration equal to that produced by an equivalent quantity of diphenylguanidine. Fusion of diphenylguanidine with sulphur does not yield a mercapto derivative. The crude fusion product has less accelerating action than an equivalent quantity of diphenylguanidine.

(3) Diphenylguanidine reacts with hydrogen sulphide when these two reagents are brought together in proper concentrations and particularly in the presence of zinc oxide to form a monosulphide. This sulphide is a more active accelerating agent than diphenylguanidine when used in equivalent quantities.—E. N. Cole Coolidge and C. E. Board.

The Influence of Glue on the Reinforcing Effect of Light Magnesium Carbonate in Rubber. Data obtained shows that one per cent of glue has the effect of considerably increasing the tensile strength and resilient energy of compounds of magnesium carbonate, but has little influence on their rigidity. The peak of the compounding range for maximum toughening effect is also considerably broadened, apparently due to improved initial dispersion of the pigment during incorporation. The increased tensile strength and work capacity are accompanied by enhanced abrasion resistance. The probable influence of glue in modifying the principal factors governing the reinforcing effects of finely divided pigments in rubber is discussed.—H. W. Greider.

The Plasticity of Rubber and Its Measurement. An apparatus for the measurement of plasticity of rubber has been devised, consisting of two parallel plates between which the sample is placed. A curve showing thickness against time is obtained when the plates are forced together by a known weight. This curve is of the type $YX^n = K$, where Y is thickness in mm. and X is time in minutes. In this equation only the constant K varies from one sample of rubber to another, Y and X being dependent variables and n a fixed constant.

The value of K changes quite rapidly with the temperature, especially in stiff samples of rubber, while the period of rest after milling is found to produce no change. The press is also adapted to the study of the setting up action of accelerators. If no change in plasticity takes place at the temperature of the experiment, the values of X and Y taken from any point on the curve will give equal value for K. If vulcanization is taking place, successive values of X and Y give increasing values for K.—Ira W. Williams.

National Exposition of Chemical Industries

THE Ninth National Exposition of Chemical Industries was held in the Grand Central Palace, New York, N. Y., September 17 to 22, 1923. This year's exposition was conducted by the International Exposition Co., managed by C. F. Roth and F. W. Payne, with an advisory committee composed of representatives of chemical societies and chemical and equipment manufacturers. By decision reached by a vote of the exhibitors the next exposition of the kind will not be held until two years hence.

At this year's show the exhibitors numbered about 400, representing practically the full range of chemical industries, from abrasives to welding. Special educational features of the show included varied daily programs of moving pictures of industrial plants and operations, conferences and lectures on technical and manufacturing topics.

Many exhibits were displayed of special interest to rubber manufacturers, among which were the following:

AMERICAN HARD RUBBER CO. This company made a comprehensive display of its hard rubber products, which include virtually everything in hard rubber. Special features were self-acting and centrifugal pumps for acid and corrosive liquids, hard rubber pipes, fittings, cocks and utensils for the chemical manufacturer, battery jars, hard rubber lined sinks, tanks, etc. Of popular interest was the display of Radion, a special product of superior dielectric quality shown in the form of panels and molded parts for radio receiving sets.

AMERICAN SCHAEFFER & BUDENBERG CORPORATION. A full line of industrial thermometers, pressure and vacuum gages and dial recording instruments featuring hand operated time punch for checking up charts in service.

BENZENE CONDENSATION CO. Equipment for solvent recovery of general applicability, especially in those divisions of the rubber industry, such as spreading, etc., where large volumes of volatile solvents are recoverable.

THE BRISTOL CO. Recording instruments in great variety for use in controlling the processes in a wide range of chemical and electrical industries, including the critical one of rubber vulcanization.

CARRIER ENGINEERING CORPORATION. A small air conditioning plant was shown in operation, illustrating the equipment as installed in many plants where the processes are facilitated by being conducted in air conditioned as to humidity, as in dry kilns for rubber and rubber compounding ingredients.

COOPER, HEWITT ELECTRIC CO. Scientific lighting system for factory and other purposes utilizing special lamps and appliances.

J. P. DEVINE CO. Industrial chemical plant and processes for impregnating, mixing, vacuum drying of products in great variety, including crude rubber dried away from contact with air.

DOW CHEMICAL CO. Chemicals for manufacturing purposes, including carbon tetra-chloride and carbon bisulphide and other products for rubber manufacturers' use.

THE B. F. GOODRICH CO. A few lines of rubber specialties, featuring a rubber lined metallic ring known as cutless bearings and sealing rings for use in pumps handling gritty water, and eliminating bearing lubrication trouble.

INDUSTRIAL CHEMICAL CO. Carbon black, red oxide, antimony, precipitated chalk, and rubber solvents and softeners for compounding.

NEW JERSEY ZINC CO. A representative showing of zinc and zinc products and their application in many lines, including mechanical and architectural uses of the metal, and zinc oxide and lithopone in paint and rubber.

A notable educational display showed the relation of zinc oxide and lithopone to rubber working. On a well laid out chart or flow sheet were shown samples of crude rubber and typical compounding ingredients passing into finished rubber goods such as tires, etc., at the opposite end; zinc oxides and lithopone being placed in the center as the critical ingredients upon which dependence is placed for securing tensile strength, abrasive quality, and color.

SMITH & SERRELL. Exhibition of the Franke flexible coupling which is adapted to use on all kinds of direct-connected machinery such as found in rubber works.

WESTINGHOUSE ELECTRIC & MFG. CO. Electric furnaces and electric heat controlling and measuring devices.

CORONA-PROOF RUBBER INSULATION

The ordinary insulation of wire with rubber, whether of the code or the 30 per cent Hevea grade, is often attended with difficulties, the rubber deteriorating rapidly when the wire carries high-voltage current unless it is covered with a lead sheath. This is because conductors raised to a sufficiently high potential are surrounded by an electrical discharge—luminous in the dark if the voltage is high enough—called corona, which takes place whether the conductor is insulated or not. Corona generates ozone from the oxygen in the air, and ozone very rapidly oxidizes rubber insulation, causing it to crack open, especially on the outside of bends.

Although corona discharge takes place at quite low voltages, it does not attain harmful intensity under about 2,000 volts and usually remains invisible up to much higher voltages. If the rubber-insulated conductor is covered with a lead sheath, either the ozone generated by the corona is kept from contact with the rubber or it does not occur at all, if the sheath is grounded, so that these cables may be used for transmission voltages.

For some classes of service, however, it is desirable to use rubber-insulated, non-leaded conductors for currents at which corona is formed. In one instance an electric light and power company faced a problem in attempting to install a system in a territory which contained many shade trees, and where ordinary insulated wire would be damaged by chafing against the branches. After various schemes had been tried out and found impracticable, a tree wire was used which had been insulated with a special rubber compound which is not affected by the ozone from corona. This wire, covered with a special saturated braid, was manufactured by the Kerite Insulated Wire & Cable Co., New York, N. Y., and, subjected to the most searching tests, it has shown conclusively that it is proof against the destructive effects of corona. This make of wire is now giving satisfactory service in actual use.—*Electrical World.*

SPECIFIC GRAVITY AND SPECIFIC VOLUME

Specific gravity is the ratio between the weight of a unit volume of a substance and the weight of the same volume of water at a given temperature, usually either 60 degrees F., or 20 degrees C. Specific gravity multiplied by 1,000 gives the weight of one cubic foot in avoirdupois ounces, or the weight of one liter, cubic decimeter in grams.

Specific volume is the quotient of one divided by specific gravity and represents the volume in cubic feet of 1,000 avoirdupois ounces, or the volume in liters of one kilogram. It also represents the ratio between the volume of one pound of water, 27.72 cubic inches, and the volume of one pound of the material in question.

What the Rubber Chemists Are Doing

The Influence of Bases on the Activity of Vulcanization Accelerators

By G. Stafford Whitby and A. Cambron

THE authors have summarized their investigation in the form of the following discussion which is here somewhat condensed.

The results recorded show that the rubber resin, and especially the acid portion of it, has a significance in regard to the vulcanization of rubber of a kind and of an importance hitherto unsuspected. The resin acid exercises a retarding influence and neutralization of this acid exercises a still greater accelerating influence on the progress of vulcanization in the presence of catalysts.[1] Neutralization of the resin acids gives rise to soaps, and soaps are in fact found to exercise an accelerating effect on vulcanization in the presence of catalysts. It would appear that they increase the degree of dispersion of the caoutchouc in the emulsion and thus lead to more rapid vulcanization by, presumably, increasing the rate of reaction between caoutchouc and sulphur.[2] If this view is accepted, the question arises as to whether the retarding effect of acids is due, not to a reduction in the concentration of accelerator present owing to decomposition of a portion of it by the acid, but rather to the (coagulating) effect of the acid in reducing the degree of dispersion of the caoutchouc.

It may be noted that in accord with the view that the accelerating effect of adding bases is due to the dispersing action of soaps formed from the resin acids is the observation that, although the maximal accelerating effect is obtained when the amount of base added is approximately that equivalent to the amount of resin acids present, the effect of small amounts of base is disproportionately large. Thus, whereas 0.30 per cent of piperidine reduces the time of setting with zinc pentamethylenedithiocarbamate from 80 to 13.5 minutes, 0.05 per cent reduces it from 80 to 28 minutes. This is in accord with the view that the accelerating effect of the addition of bases is due to the formation of dispersing agents, as the dispersing effect of an emulsifying agent is proportionately greatest with small quantities and does not increase in direct proportion to increase in the concentration of the agent.

A number of other points may be remarked. The piperidinium salt of pentamethylenedithiocarbamic acid is much more active than the corresponding zinc salt. A mixture of the zinc salt and one equivalent of piperidine was found to show substantially the same activity as the piperidinium salt. Furthermore, it was found that the piperidinium salt is capable of reacting with zinc oxide to form the zinc salt.

The mode of action is as follows: The salt reacts with zinc oxide to give the zinc dithiocarbamate, and the salt-forming molecule of piperidine thus set free forms with the resin acids soaps which accelerate the rate of vulcanization under the influence of the zinc dithiocarbamate.

A similar state of affairs clearly explains the much greater activity of the ammonium than of the zinc salt of phenylmethyldithiocarbamic acid: The ammonium salt reacts with zinc oxide to give the zinc salt, and the ammonia forms soaps with the resin acids.

The fact that bases are able to enhance the rate of vulcanization in the presence of accelerators by virtue of their ability to neutralize wholly or partly the resin acids and so form soaps suggests that in some cases at least—especially the cases of the stronger bases—the action of such substances in accelerating vulcanization may be partly or largely due, not to the direct catalytic action of them or their reaction-products on the reaction between caoutchouc and sulphur (or whatever process may lie at the root of vulcanization), but rather to the increase in the degree of dispersion of the caoutchouc which they bring about by forming substances of the type of soaps. Similarly, the formation of soaps may explain the known accelerating activity of caustic alkalis.[3]

Since, as Whitby and Dolid[4] have recently pointed out that sterols are good emulsifying agents, it would appear that sterols tend to give an emulsion of the type opposite to that given by soaps, and hence that they tend to reduce, rather than to increase, the degree of dispersion of the caoutchouc when they are added to a rubber cement. A further examination of this question and an examination of the significance in regard to vulcanization of the sterols which Whitby and Dolid have found in Hevea resin is reserved for a later occasion.

[1] The effect of introducing strong bases in increasing the rate of vulcanization is not confined to the vulcanization of cements; the addition of piperidine has been shown to increase the rate of vulcanization of ordinary dry stocks containing ultra-accelerators (Whitby and Simmons, meeting of Rubber Division, American Chemical Society, New Haven, April, 1923).

[2] It is proposed to make a more general examination of the interesting question which this conclusion suggests; the question, namely, of the influence of the degree of dispersion of the internal phase on the rate of chemical reaction in an emulsion.

[3] Since this paper was read, Bedford and Winkleman (meeting of Rubber Division, American Chemical Society, New Haven, April, 1923), have shown that the activity of litharge, magnesia, and lime is due to the formation of salts from the resin acids or from other acids introduced as substitutes. These authors consider the metallic salts thus formed to be the actual catalysts of the reaction between caoutchouc and sulphur, but it is not impossible that their action may be due, at least in part, to their emulsifying power—bringing about a higher degree of dispersion of the caoutchouc. Magnesium oleate is known to be a good emulsifying agent. It is not impossible that the "activating" effect which zinc oxide exercises on some accelerators is due in part to the dispersing action of zinc soaps formed by it from the resin acids, although it is clear that in the case of ultra-accelerators such is not its main mode of action.

[4] Meeting of Rubber Division, American Chemical Society, New Haven, April, 1923.

The Acidity of Raw Rubber[1]

By G. Stafford Whitby and A. R. Winn

In view of the importance in regard to the vulcanization of rubber which the acids present in Hevea resin have been shown to possess,[2] it was desirable to ascertain whether different samples of raw rubber vary to any considerable extent in the amount of acid which they contain. Determinations of the total-acid-content of a number of more or less random samples of plantation Hevea rubber were made by titrating the acetone extract with alkali.

In the following table are shown the acid numbers of eighteen samples of raw plantation rubber belonging to various types. We define the acid number as the number of milligrams of potassium hydroxide required to neutralize the acid in the acetone extract from 100 g. of rubber. The samples are arranged in the magnitude of their acid numbers. The acetone extracts of the samples, as determined by a 48-hour extraction are also recorded in the table.

In the case of sample No. 6, a determination of the acid number was also made on an alcoholic extract, the figure obtained being 298.

The samples exhibit a wide variation in their total-acid-content. The data show that even with the same grade of rubber the variation may be considerable. Thus the acid numbers of eight samples of smoked sheet range from 236 to 289; and between samples belonging to different grades the variation shown in acid numbers is surprisingly large, a sample of sprayed rubber showing an acid number of 390, whereas one of dark brown crêpe shows an acid number of only 92.

[1] Read before the Montreal Section of the Society of Chemical Industry, March 19, 1923.

[2] "The Influence of Bases on the Activity of Vulcanization Accelerators." By G. Stafford Whitby and A. Cambron.

TABLE I

No.	Sample description	Acetone extract %	Acid number
1.	Sprayed rubber (crêped)	4.85	390
2.	Pallish brown crêpe	3.00	320
3.	Sprayed rubber (blocked)	4.00	301
4.	Pale latex crêpe	3.02	296
5.	Pale latex crêpe	3.01	289
6.	Smoked sheet	3.25	289
7.	Smoked sheet	2.82	284
8.	Dark smoked sheet	3.37	283
9.	Smoked sheet	3.15	283
10.	Smoked sheet	3.35	280
11.	Smoked sheet	3.13	276
12.	Smoked sheet	3.05	270
13.	Smoked sheet (milled or hot rolls)	2.22	239
14.	Smoked sheet	3.33	236
15.	Slab crêpe	2.44	224
16.	Brown crêpe. Second sub-grade	2.74	223
17.	Gravish brown crêpe	1.79	139
18.	Dark brown crêpe	1.77	92

If the resin acids are assumed to have a mean molecular weight of about 350, the results indicate that in average samples of latex rubber the amount of free acid present is of the order of 1 per cent of the weight of the rubber or 60 per cent of the acetone extract.

Some of the differences in behavior which preserved latex shows when compared with fresh latex are explicable by supposing that in preserved latex the resin acids have undergone partial or complete neutralization with the formation of soaps. This may also be a factor in the preservative action of alkalis, since, as dispersing agents, soaps derived from the resin acids would presumably assist in the stabilization of the caoutchouc dispersoid.

The action of alkalis on raw rubber is of interest, both because of the influence of alkalis on vulcanization, and because caustic alkalis are good and cheap latex preservatives.

The Effect of the Oxides of Arsenic on the Rate of Vulcanization of Rubber[1]

By B. J. Eaton and R. O. Bishop

The investigations made by the authors were carried out as a result of certain abnormalities observed in the rate of cure of rubber-sulphur mixings due to the use of different batches of sulphur. The authors summarize their results as follows:

Arsenious oxide, arsenic oxide, arsenious sulphide, metallic arsenic, and certain organic arsenic compounds accelerate or retard the rate of vulcanization of rubber, according to the proportions employed. Arsenious oxide in very minute proportion accelerates vulcanization in rubber-sulphur mixes and larger quantities within limits do not produce greater effects.

Arsenious and arsenic oxides also affect the "slope" of the tensile curves, producing an "inferior" compound and the tensile properties appear to be very erratic, especially with the larger proportions.

The proportions which affect the variability in the rate of vulcanization are of the order of the amounts which might be present as impurities in sulphur or other chemicals used in the preparation of raw rubber or the manufacture of rubber goods.

The effect is reversed by the addition of zinc oxide, which points to the fact that different effects are probably produced in technical mixings.

Variations in the vulcanization effect of different batches of sulphur may be due to the presence of arsenic as an impurity.

Water soluble organic arsenic compounds may be of some value as vulcanization accelerators.

Later experiments, not described in this communication, in which inert compounding ingredients, such as china clay, were added to the rubber-sulphur mixing to produce compounds suitable for certain commercial purposes, show that arsenic compounds still effect acceleration in rate of cure in such mixings, indicating their possible suitability in certain cases.

It is proposed to continue these investigations in order to elucidate points which are at present obscure.

[1]*Journal of the Society of Chemical Industry*, July 20, 1923, 304T-307T.

Effect of Organic Accelerators on the Variability of Rubber[1]

Summary

The variation in the time required for the vulcanization of different samples of rubber is entirely altered by the addition of the usual organic accelerators and zinc oxide. A slow-curing rubber (rubber-sulphur mix) may vulcanize comparatively quickly in the presence of an added accelerator, while a quick-curing rubber may vulcanize comparatively slowly.

In the presence of a mild accelerator one per cent thiocarbanilide and five per cent of zinc oxide, the rate of combination of rubber and sulphur and the time of vulcanization required to attain the maximum tensile strength both varied for 8 rubbers by ± 17 per cent, as compared with ±26 per cent for the rubber-sulphur mix.

Rubbers compounded with an accelerator and a little zinc oxide vary widely as regards the physical properties corresponding with a specified amount of combined sulphur. The variation is so large that it is sometimes impossible to vulcanize two rubbers to the same physical properties as determined by the elongation at a given load. Similarly, there is a large variation in the elongation at a given load when cured to give the maximum tensile strength. As the vulcanization coefficients of rubbers cured to give the same stretch at a given load increase, the elongations at the cures which give the maximum tensile strength also increase in the same proportion. These variations are due to the varying amounts and nature of the acetone-soluble accessory substances present in rubber.

A large amount of zinc oxide and an accelerator generally decrease considerably the variability in time of cure and also ensure rubbers vulcanizing to give the same vulcanization coefficient for the same physical properties for the same mix. In the case of aldehyde-ammonia the differences between the time of cure, rubber-sulphur mix, were not reduced.

[1]G. Martin and W. S. Davey. *Journal of the Society of Chemical Industry*, March 16, 1923, 98T-106T.

KADOX

The name Kadox is used to designate a new and special zinc oxide of such extremely fine particles that they can be seen only under the highest powered microscope. Each particle is approximately one two hundred and fifty thousandth of an inch in size. In addition to possessing the recognized advantages of standard zinc oxides in rubber compounds Kadox also has a largely increased surface which results in higher tensile strengths, greater resistance to abrasion and a marked accelerating effect in vulcanization.

FLUXOL

A resinous material derived from hardwood tar is marketed under the name of Fluxol as a softener for rubber mixings. It is similar to mineral rubber in appearance and consistency but superior in fluxing and aging properties. The combination of Fluxol and Cycline oil is widely used for facilitating such factory operations as milling, calendering and tubing.

PARRAYNITE

Parraynite is a trade name referring to a rubber composition which offers resistance to the harmful X-rays. It is applied to aprons and overalls to protect operators from injury by prolonged exposure to X-rays. Samples of the material tested at the National Physical Laboratory showed the following results: 3.1 mm. thickness was equivalent to 1 mm. metallic lead; 5.3 mm. thickness, equivalent to 1.7 mm. metallic lead.

Chemical Patents

The United States

Material for Frictional and Wearing Purposes. A composition for use in friction coating fabrics consisting substantially of two parts dammar gum, one part of rubber, two parts drying oil, and five parts of a solvent.—Herbert Frood, assignor to Ferodo, Limited, both of Chapel-en-le-Frith, England. United States patent No. 1,463,506.

Filler and Accelerator. A composition consisting of rubber and a filler consisting of calcined tuffaceous breccia which has been ground to powder.—Augustus Warren Gould, Mount Angel, Oregon; Hazel Phelan, executrix of said A. W. Gould, deceased. United States patent No. 1,463,781.

Acceleration of Vulcanization and Products Obtained. A process comprising combining with rubber a vulcanizing agent, a metal M, carbon disulphide and an amine having a replaceable ammoniacal hydrogen, the carbon disulphide and amine being combined with the rubber as separate materials with respect to one another, and vulcanizing the rubber.—Sidney M. Cadwell, Leonia, New Jersey, assignor to The Naugatuck Chemical Co., Naugatuck, Connecticut. United States patent No. 1,463,794.

Rubber Composition. The combination of vulcanized rubber and fish scales.—Niels D. Nielsen, Elyria, Ohio. United States patent No. 1,463,905.

Preparation for Treating Rubber Articles. A preparation for treating rubber articles which comprises petroleum jelly, lamp black, cod liver oil, rubber and benzene in specified proportions.—J. B. G. Taber, New Haven, Connecticut. United States patent No. 1,464,143.

Vulcanization of Rubber. The process of vulcanizing rubber which consists in modifying the melting point or nitrogen content of nitrogenous bodies that melt above the ordinary temperatures of vulcanization, by incorporating with them, into a "solid solution," one or more of such other miscible or suitable bodies as will so modify them as to make them available as accelerators, then incorporating the accelerators thus formed into rubber and heating the mixture with a vulcanizing agent to effect vulcanization.—George H. Stevens, Newark, New Jersey, and Corl H. Eaton, East Palestine, Ohio; said Eaton assignor of eight-twentieths to Seth R. Clark, Springfield, Massachusetts, and one-twentieth to D. P. Swisher, Oil City, Pennsylvania. United States patent No. 1,465,743.

The United Kingdom

Rubber Sole and Heel Making Process. Rubber soles and heels are composed of an outer layer of vulcanized rubber, preferably under-cured, and a backing layer of unvulcanized rubber mixed with about ten per cent of sulphur and about one per cent of carbon which becomes vulcanized by the heat and pressure to which it is subjected during use. The sole is attached to the shoe by means of a solution of hard rubber in a mixture of equal proportions of carbon tetrachloride and trichlorethylene.—R. Surridge, 73 Church street, Camberwell, London. British patent No. 198,239.

Tanned India Rubber. Rubber in a plastic state is heated with tanning agents such as extract of hemlock, etc., and rolled into sheets or otherwise shaped to produce a material having the appearance of leather. The tanned rubber is slightly plastic and is soluble in most of the usual solvents of rubber. Coloring and filling materials may be added before, during, or after treatment of the rubber with the tanning agent, and the product be combined with fabric, etc., in the usual way. The material may be rendered fireproof by soaking it in a solution of protochloride of tin and may be made tougher and more porous by treatment with alum solution.—C. Marter, 42 Devonshire Chambers, Bishopsgate, London. British patent No. 198,914.

Vulcanizing Rubber. Rubber is mixed with a non-gaseous vulcanizing ingredient, the mixture is treated with a halogen-free substance adapted to permeate it while maintaining the shape of the mass substantially unaltered, and the treated mixture is vulcanized. Numerous examples are given in the specification, of which the following is typical: 100 parts of rubber, 10 parts of zinc oxide, 6 parts of normal oxybutylthiocarbonic acid disulphide, and 3 parts of sulphur compounded to form one stock. The stock may be merely exposed to aniline gas or liquid, or a stock containing aniline may be formed into articles which are then painted with oxybutylthiocarbonic acid disulphide. A fabric may be painted with aniline and a rubber mixing, as mentioned, calendered on to it.—Naugatuck Chemical Co., Elm street, Naugatuck, Connecticut, assignees of S. M. Cadwell, 200 Ames avenue, Leonia, New Jersey. British patent No. 174,915.

Vulcanized Rubber Dough. Vulcanized rubber doughs are produced by preparing a self-vulcanizing gelling solution and mixing this solution before it gels with a precipitant for rubber, such as acetone, alcohol, etc. By adding the gelling solution to a mixture of a precipitant and solvent such as benzene or naphtha a stable non-gelling solution of vulcanized rubber results.—F. C. Jones, 212 Upper Thames street, London. British patent No. 199,095.

Flexible Tubing Material. A suitable composition for impregnating and coating fabric for making hose for use in mine ventilation, dissolved before use, consists of 41 parts of rubber, 5 parts of pine tar, 6 parts of paraffin, 19 parts of asbestos flour, and 52 parts of barytes.—E. C. R. Marks, 57 Lincoln's Inn Fields, London. (E. J. Du Pont de Nemours & Co., Wilmington, Delaware.) British patent No. 199,516.

Plastic Compositions. A composition suitable for the manufacture of cricket balls, heels, etc., is made according to the following example: 4 parts of glue solution containing 35 per cent of dry glue are mixed with 1 part of boiled linseed oil containing 10 per cent of rubber, and 2½ per cent of carbolic acid. This is mixed with 5 to 6 parts of shredded leather in a steam heated mixer and articles are molded at a pressure of 1 to 4 tons per square inch.—G. A. Ampt, 12 Wentworth avenue, Canterbury and S. C. Lansdown, 465 Rae street, North Fitzroy, both in Victoria, Australia. British patent No. 199,614.

The Dominion of Canada

Rubber Vulcanizing Process. The process of treating rubber or similar material which comprises combining it with a vulcanizing agent and a metallic anthogenate, and vulcanizing the rubber.—The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of Iwan Ostromislensky, Locust Point, New Jersey. Canadian patent No. 233,296.

Germany

Patents Issued with Dates of Issue

381,461 (August 6, 1921). Method of making hot vulcanized foam of rubber or similar substances. Fritz Pfleumer, Bodenbacherstrasse 44, Dresden.

381,781 (October 22, 1922). Method of vulcanizing rubber. Dr. Richard Feibelmann, Radebeul bei Dresden.

381,881 (May 26, 1921). Method of making porous rubber masses. Karl Henry Fulton, Pittsburg; represented by B. Kugelmann, Berlin-Wilmersdorf.

382,374 (May 1, 1920). Method for improving the properties of crude rubber. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin S.W. 11.

ANNUAL MEETING OF S. A. E. TO BE HELD IN DETROIT

The annual meeting of the Society of Automotive Engineers will be held January 22-25, 1924, in Detroit, Michigan, in order to coincide with that city's automobile show week. It is expected that the coming meeting will be one of the largest in the history of the organization because of its location near the production center of the automobile industry.

The Editor's Book Table

Book Reviews

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into Austria." A monograph prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

It is interesting to note that Austria's rubber factories have increased in number from 25 in 1919 to 30 in 1920 and 35 in 1921. With the exception of tires, more rubber goods are said to be manufactured in Austria than the local demand requires and a fairly important export trade is developing. With the continued improvement of economic conditions the Austrian rubber goods market will become more important, especially as Vienna is normally a clearing house for a wide area embracing the Succession States, Poland, and the Balkans.

"PREPARATION OF SMOKED SHEET." By W. S. BURNETT. PUBlished by *The Times* of Ceylon Co., Ltd., Colombo and London. Paper, 36 pages, 5 by 8 inches.

In a brief foreword the author of this little publication states that his compilations represent mainly the results of his own experience. Under separate headings dealing with the preparation and curing of smoked sheet, the process of manufacture, the construction of sheds and smokehouses, and the use of the Metrolac, there are many useful items regarding this particular subject. Several tables of statistics are included.

"CHEMICAL ENGINEERING CATALOG—1923." EIGHTH ANNUAL Edition. Published by The Chemical Catalog Co., Inc., 19 East 24th street, New York, N. Y. Leather, 1049 pages, illustrated, 9 by 11½ inches.

Several new features of importance appear in this eighth annual edition of a standard work of reference. It is noted, for example, that the section begun in 1918 and devoted to brief mention of technical and scientific books, has been greatly enlarged and arranged in improved form in the new edition. A series of scientific and technical monographs, obtained by the American Chemical Society and published by the Chemical Catalog Co., is also in course of preparation, while still other improvements distinguish this volume from earlier editions. As usual it is well arranged and carefully indexed.

New Trade Publications

AN ATTRACTIVE AND WELL-ILLUSTRATED LITTLE PUBLICATION entitled "Rubber Products for the Oil Industry," has been recently published by The Manhattan Rubber Manufacturing Co., Passaic, New Jersey. Much comprehensive information regarding oil hose, packing, valves, gaskets, etc., is included in this booklet, which has been especially prepared with the interests of the oil industry in mind. Several tables of specifications as adopted by The Rubber Association are included.

IN A WELL ILLUSTRATED AND RECENTLY PUBLISHED BULLETIN The Bristol Co., Waterbury, Connecticut, sets forth the main features of its controller and safety stop valves. The company also specializes in the manufacture of temperature controllers and recording pyrometers, as well as a very extensive line of pressure and vacuum gages, recording thermometers, engine and revolution counters, etc.

A NUMBER OF ATTRACTIVE DESIGNS OF "TIPPERARY" SHOES, intended for athletic and summer wear, appear in a well-illustrated catalog for the season of 1924 as issued by The Columbus Rubber Co. of Montreal, Limited, 1349 Demontigny street, East, Montreal, Canada. Many of the shoes featured in the catalog have white, red, or crêpe rubber soles.

Recent Articles Relating to Rubber

The Solvent Properties of Acetone. The complete miscibility of acetone with water makes it an excellent dehydrating agent, and its miscibility with numerous other solvents permits its use with them, thereby increasing their individual efficiency. In some instances the addition of a small amount of acetone to two immiscible liquids produces a homogeneous solvent. Acetone is not as inflammable as benzine, toluene, ethyl ether, petroleum ether, gasoline or pentane. Its pathological effects are negligible. It is used successfully as a solvent for acetylene, cellulose triacetate, cellulose nitrates, celluoid, gums, resins, oils, and fats.—R. F. Remler. *Industrial and Engineering Chemistry*, July, 1923, 717.

The Properties of Rubber Prepared by the Hopkinson Spraying Process. A study of the properties and working qualities of L. S. crude rubber.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, August, 1923, 445-50.

The Creaming or Separation of Preserved Rubber Latex. Review with quotations of article entitled "Studies on Rubber Latex," THE INDIA RUBBER WORLD, August, 1923, 703-6.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, August, 1923, 445-50.

Plauson Colloid Mill. The Plauson mill and its operation is described. Reference is made to its power consumption. The conclusion of the discussion is that there are many places where the mill can be used in chemical industry provided the power cost is not excessive for the product. Present main disadvantages are the power it requires and its small capacity.—W. J. Kelly. *Industrial and Engineering Chemistry*, September, 1923.

Use of Brown Colored Paraffin Containing Acetic Acid in Rubber Preparation. The concentrated acetic acid supplied to the rubber estates is sometimes discolored brown by the presence of traces of paraffin from the barrels. Its use, however, has no harmful influence on the rubber produced.—O. de Vries. *Communications, Central Rubber Station*, Buitenzorg, Java, 1923, No. 32, 1-6.

Preservation of Rubber Latex with Ammonia. For the preservation of latex under favorable conditions 15 cc. of aqueous ammonia (sp. gr. 0.9327) per liter or approximately 0.25 per cent of pure ammonia will suffice, but for actual practice the proportion should be raised to 0.33 per cent or even 0.5 per cent of ammonia.—O. de Vries, N. B. Nieuland, and R. Riebl. *Communications, Central Rubber Station*, Buitenzorg, Java, 1923, No. 33, 1-31.

Rate of Drying of Rubber. I. Influence of different factors in preparation: experiments on different ways of treating the coagulum. O. de Vries. *Communications, Central Rubber Station*, Buitenzorg, 1923, No. 32, 7-35.

Caoutchouc Formolites. F. Kirchhof. *Chemicher-Zeitung*, 1923, 47, 513.

The Ash of Rubber and Its Significance. About 0.5 per cent of ash was obtained from the latex of rubber from Hevea. The predominant constituents were potassium oxide and phosphoric acid. Analyses are given.—Alexander Bruce, *Tropical Age*, 59, 267-8, 1922.

Effect of Litharge on Accelerators of Vulcanization. P. L. Bean. *India Rubber Journal*, 64, 1051-2, 1922.

Vulcanization. A review.—H. P. Stevens, *Rubber Age*, London, 4, 87-94, 127-34, 1923.

Effect of Resting on the Rate of Cure; Rubber Coagulated with Hydrofluosilicic Acid and Its Salts; Effect of Soaking Sheet in Sodium Silico-Fluoride Solution. A series of reports of research work.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, July, 1923, 381-4.

Practical Value of Products of Dry Distillation of Scrap Rubber. Two samples of products of dry distillation of scrap rubber, prepared in the Dutch Indies, are examined as to their fitness as substitutes for turpentine oil; both are found to be valueless. The fractions distilling under 200 degrees, however, which are ½ of the total, can be used as substitutes for turpentine, the physical constants, the volatility, and the power of dissolving resins and rubber being the same.—A. van Rossem and P. Dekker. *Chemical Weekblad*, 1923, 20, 78-82.

Physico-Chemical Studies on Rubber. I. The viscosity concentration formula for rubber solutions.—K. Shimada. Kôgyô-Kwagaku Zasshi (*Journal Chemical Industry, Japan*), 1923, 26, 705-708.

Rubber from Evaporated Latex. O. E. de Vries. *India-Rubber Journal*, Vol. 66, 1923, No. 3, 7-8.

Substitution and Addition of Chlorine to the Rubber Molecule.[1] Substitution occurs first in an uncontrolled temperature reaction of chlorine with rubber. It is complete before any addition occurs. A quick method is given by which the rate of the chlorination of rubber may be determined at any particular time.—J. Mc Gavack. *Industrial and Engineering Chemistry*, September, 1923, 961-2.

Determination of Total Sulphur in Rubber Goods.—S. Collier, Michael Levin, and R. T. Mease, Bureau of Standards, Washington, D. C. *Industrial and Engineering Chemistry*, September, 1923, 953-5.

Rubber Solvents and Lacquers. A collection of useful data.—Dr. E. O. Rasser. *India Rubber Journal*, August 18, 1923, 11, 261-4.

The Vulcanization of Rubber. Part II of Third Cantor Lecture before the Royal Society of Arts.—H. P. Stevens. *India Rubber Journal*, August 11, 1923, 225-229.

Dielectric Properties of Rubber. A comprehensive and authoritative paper covering all phases of the subject, read before the Institution of the Rubber Industry, London, June 10, 1923.—W. S. Flight. *The Rubber Age*, London, September, 1923, 371-380.

Vulcanization of Rubber. A series of six articles reporting experimental studies covering the various methods of vulcanization.—B. V. Bysow and M. K. Popowa. *Journal of the Russian Physical and Chemical Society*, 1921, 53, 20-64; 65-78; 79-100; 109-119; 120-165; 166-180.

The Plasticity of Crude Rubber. (Italian).—B. Marzetti, *Giornale di Chimica Industriale ed Applicata*, Milan, July, 1923, 342-343. Diagram, illustration.

What Is the Best Method of Bud-Grafting Hevea Brasiliensis. (Dutch).—J. v. Baalen. *Algemeen Landbouw weekblad voor Nederlandsch-Indie*, Bandoeng, July 28, 1923, 121-122. Diagrams.

Latices Containing Rubber and Their Industrial Importance. I. (French.)—E. de W. *Le Caoutchouc & la Gutta-Percha*, Paris, August 15, 1923, 11893-11897. Tables.

The Catalytic Decomposition of Amides. II. (French) A. Mailhe. *Le Caoutchouc & la Gutta-Percha*, Paris, August 15, 1923, 11898-11900.

Rubber Paving and Rubber Mosaic Carpeting. (French). Albert Hutin. *Le Caoutchouc & la Gutta-Percha*, Paris, August 15, 1923, 11902-11904.

Up-to-Date Rubber Cultivation. (Dutch).—J. G. J. A. Maas. *Archief voor de Rubber-cultuur*, Buitenzorg, July, 1923, 269-283. Tables.

Brazil an Ideal Land for Rubber Cultivation. (Dutch). I. The writer tries to prove the opposite of what was set forth in the original article under this heading in THE INDIA RUBBER WORLD, April, 1923, namely, that Brazil can never succeed in planting rubber.—Anonymous. *Nederlandsch-Indisch Rubber-en Thee Tydschrift*, Weltevreden, Java, July 15, 1923, 284-287.

Brazil an Ideal Land for Rubber Cultivation. (Dutch) II. —Anonymous. *Nederlandsch-Indisch Rubber-en Thee Tydschrift*, Weltevreden, Java, August 1, 1923, 315-317. Table.

[1] Presented before the Division of Rubber Chemistry at the 65th meeting of the American Chemical Society, New Haven, Conn., April 2 to 7, 1923.

Judicial Decisions

In Re The B. F. Goodrich Co. Court of Appeals of District of Columbia. Decided January 2, 1923. No. 1,531.

The Commissioner refused registration of the word "Safety" as a trademark for tire casings made of rubber combined with fabric on the ground that the word had been previously registered for "conducting hose composed of rubber and fabric," which the Commissioner ruled were goods of the same descriptive properties as those on which applicant used its mark and also on the ground that the word is descriptive. The Court agreed with the Commissioner that the trademark "Safety" falls within the class which the section forbids the Commissioner to register, and his decision is therefore affirmed.—*Official Gazette*, August 28, 1923, 663.

Kremer vs. Harsel. Court of Appeals of District of Columbia, decided April 3, 1923.

In an appeal from a decision of the Patent Office in an interference proceeding awarding priority of invention to Harsel, the question being a matter of tire manufacture, the Examiners in Chief and the Assistant Commissioner found that Harsel, in the employ of the Goodyear Tire & Rubber Co., Akron, Ohio, had reduced his invention to practice in 1916. His application is also said to be in regular form, and his claims undoubtedly take precedence over those of Kremer, or others. The Patent Office decision is therefore affirmed.—*Official Gazette*, August 21, 1923, 459.

Climax Rubber Co. vs. U. S. Compression Inner Tube Co. Appealed from decision of Examiner of Interferences. Decided July 7, 1922.

This is an appeal from the action of the Examiner of Interferences sustaining a petition to cancel registration No. 135,877, U. S. Compression Inner Tube Co., dated October 19, 1920, for a trademark for inner tubes for pneumatic tires. The registration was effected under section (*b*) of the act of March 19, 1920, which includes only "marks not registrable under the act of February 20, 1905."

The mark here in issue consists of the word "Compression," and the fact that it has been placed on register of the act of 1920 shows that it is not a technical trademark such as could be registered under the act of 1905. The evidence amply supports the claim of the Climax company that they have used the word "Compression" in connection with their inner tubes since prior to the date of the application for registration. The decision of the Examiner of Interferences was therefore affirmed.—*Official Gazette*, August 21, 1923, 453.

UNITED STATES IMPORTS OF CRUDE RUBBER INCREASE RAPIDLY

The tremendous growth of this country's rubber industry, where our importations of crude rubber represent, during the first half of 1923, a value more than double that for the corresponding months of 1922, is indicated by the following figures:

	1922		1923	
	Pounds	Value	Pounds	Value
January	54,010,946	$8,110,912	79,763,620	$14,310,825
February	66,744,240	10,827,106	60,379,290	13,150,823
March	64,215,222	10,999,040	69,280,696	19,041,565
April	43,407,359	7,272,098	69,446,775	21,876,398
May	35,727,058	5,427,697	80,107,447	24,953,222
June	50,952,024	7,422,114	79,188,711	23,941,937
Totals	315,056,849	$50,058,967	438,166,539	$117,274,770

Total imports into the United States of crude rubber were estimated at the value of $73,756,694 for the year 1921, and $101,843,280 for 1922. It will be noted that the value for the six-months period of 1923 is greater than the total for the entire year of 1922.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

New Machines and Appliances

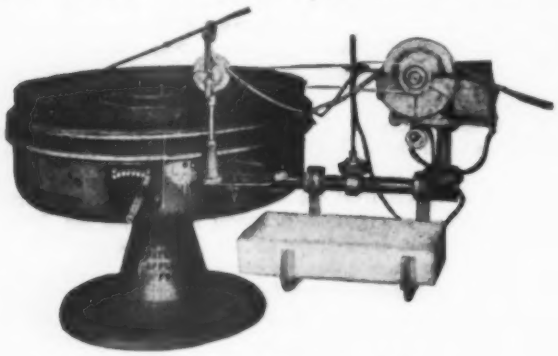
Machine for Coiling and Soapstoning Tubing

THE machine here illustrated is an effective electrically operated device which combines means for automatically soapstoning and coiling raw tubing and similar stock as delivered from a tubing machine. The machine is mounted on a pedestal and encases a motor for turning the coiling pan.

The extruded tubing is guided over two grooved wheels, its speed being controlled by a light adjustable arm intermediate between them, which is so set that the tubing is coiled without stretching.

The machine soapstones the tubing on the outside and at the same time coils it in the pan. If the interior of the tubing requires soapstoning a simple adjustable attachment is provided by which the soapstone is supplied with no excess air pressure which might distend the uncured tubing out of size.

The same operator can feed the tubing machine and control the

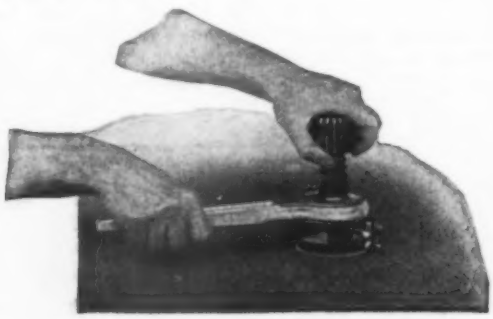


Smith Coiling and Soapstoning Machine

panning of the product where this machine is in use, thus saving the expense of one person at the coiling pan.—H. Munroe Smith, Box 198, Passaic, New Jersey.

Adjustable Washer Cutter

A very convenient hand tool for cutting rubber washers from sheet packing and holes in any material from paper to steel is shown in the illustration.



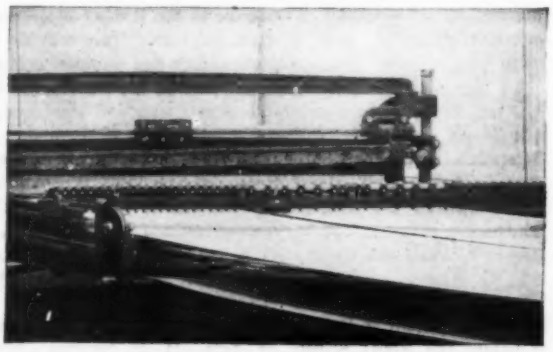
"Jiffy" Washer Cutter

It has two readily renewable knives adjustable for cutting holes from 1¼ to 6 inches in diameter. The tool is compact and easily carried to the job or used at the bench. Manual pressure on the knives is unnecessary, a turn of the large nut on top of the stud applies heavy spring pressure to the work.

By means of its ratchet handle the tool can be used against a wall, in corners, on the floor, overhead, or in any other position.—Paul W. Koch & Co., 19 South Wells street, Chicago, Illinois.

Bias Cutter Creep and Gripper Bars

The illustration represents an improved creep and gripper bar specially designed for the Birmingham bias cutter. This bar eliminates inaccuracies in cutting and materially increases production



Creep and Gripper Bar for Birmingham Bias Cutter

due to its smooth and positive action which allows speeding up. With this device cord fabric can be cut within 1/16-inch of accuracy.

Cord fabric has a tendency to stretch more on the long than on the short side, but with the new gripper bar, which has 51 fingers as against 23 on the old type, the fingers are individually adjustable so that those on the long side can be made to retain their hold slightly longer than on the other, thus counteracting the tendency of the cord fabric to stretch or creep back unevenly. On the latest type gripper the latch is located in the middle of the bar, having a stronger and more positive action. The greater number of fingers exert more uniform tension across the entire width of the fabric than was possible with the old type bar.

Each of these devices is made up as a complete unit so that with only a few hours' labor by any mechanic they can be easily applied to bias cutters already installed.—Birmingham Iron Foundry, Derby, Connecticut.

Double Action Tire Spreader

The convenient and practical tire spreading tool here pictured is intended to meet the needs of the vulcanizing shop, service station, and tire dealer. The tool is made of cold rolled steel and nickel plated. It is operated by inserting the prongs between beads and pulling the lever, which forces the beads apart for inspecting

Akron-Williams Tire Spreader

the tire, inserting air or sand bags, making an inside repair, etc. The tool is automatically locked in open position until the lever is released.—The Williams Foundry & Machine Co., Akron, Ohio.

Wire Insulation Stripper

A new tool of interest to makers and users of insulated wire, vulcanizers, garage men, and automobilists in general is shown in the illustration.

Bard-Parker Wire Stripper

It is a wire insulation stripper similar both in appearance and operation to a pair of ordinary pliers, the essential difference being that the jaws open on compression of the handles, instead of closing. The left hand jaw carries a sliding clamp for gripping the wire, while the right hand jaw carries a sliding blade for cutting and stripping the insulation. When the jaws move apart on compression of the handles the left hand grip pulls the wire through the right hand blade after the insulation has been cut. The blade has a notch in its edge to clear the copper as the insulation is pulled off the end of the wire. This action is made automatic by pivoting the handles on the jaws.

With this tool as high as 1,500 wire ends have been stripped in an hour. It will prove a very profitable tool wherever insulated wire is made or used.—Bard-Parker Co., Inc., 150 Lafayette street, New York, N. Y.

Industrial Fork Lift Truck

The necessity of rapidly and conveniently moving heavy pieces of rubber equipment such as tire molds, cores, loaded compound boxes, and various heavy pieces of machinery is met by the electric fork lift truck here illustrated. It enables one man to load with ease and transport a 2,500-pound piece of machinery anywhere about the mill.

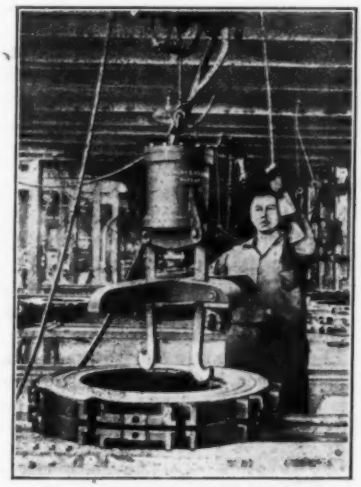
Elwell-Parker Electric Lift Truck

This truck is essentially an electric lift truck with provision for carrying load beyond its front axle. The platform or fork which supports the load is such that its lower side will touch the floor if necessary or it can be stopped at any height between upper or lower limits. The ends of the fork are so shaped that they may be inserted beneath the load.

The raising mechanism consists of a separate motor with worm gear reduction attached to a movable platen supported on the truck frame by means of three rocking links. The propelling unit consists of a heavy duty motor and controller direct connected through a flexible coupling to worm and wheel with bevel pinion differential running in oil. Drive shafts with universal joints and clutch plates bolted to outside wheels complete the full floating drive axle. The drive wheels turn on double row ball bearings and the front wheels on long double roller bearings.—The Elwell-Parker Electric Co., Cleveland, Ohio.

Pneumatic Mold Closing Machine

The mold closing device here pictured has been demonstrated in actual service for economically handling molds in which tires are cured by the air bag process. The usual method of tire molding requires the use of side rings in conjunction with rimming presses. The new system which requires only one handling of the molds operates as follows:



Duncan and Kerns Mold Closer

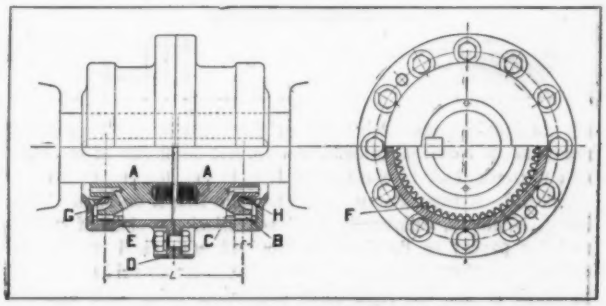
A mold is unloaded from the vulcanizer, the air bag is deflated, the tire removed, and the uncured tire containing an air bag is placed in the mold. The mold closing device is then brought into action by which the upper half of the mold is closed and clamped between the hooks and the X-shaped piece actuated by heavy pneumatic pressure. The mold halves are thus held solidly together while being secured by bolts attached by hand before transference to the vulcanizer.

The mold closer is arranged to be suspended from a trolley mounted on a track located above the vulcanizer run-way. By this means it can be brought into action conveniently at any point required. The device not only eliminates needless equipment but reduces the labor cost of mold handling.—David Bridge & Co., Ltd., Castelton, Manchester, England.

Self Alining Coupling

A form of flexible coupling which is giving excellent service in American rubber mills is that shown herewith.

It consists of two hubs A, A, keyed to respective shafts. Each hub has an external spur gear B cut on it at the maximum distance possible from the shaft end. Surrounding these hubs is casing C which is transversely split in its center, and bolted together by means of flanges D. Each half of this casing has an internal spur gear E cut on its bore at the end opposite its flange. The gears E engage the external gears B.



Fast Flexible Turbo Coupling

Supporting rings G positively control the center line of each shaft intercepting the center line of the casing at the transverse center lines through the load carrying surfaces. For couplings up to and including 5-inch shafts the supporting ring is made integral with the casing. For larger couplings it is bolted on.

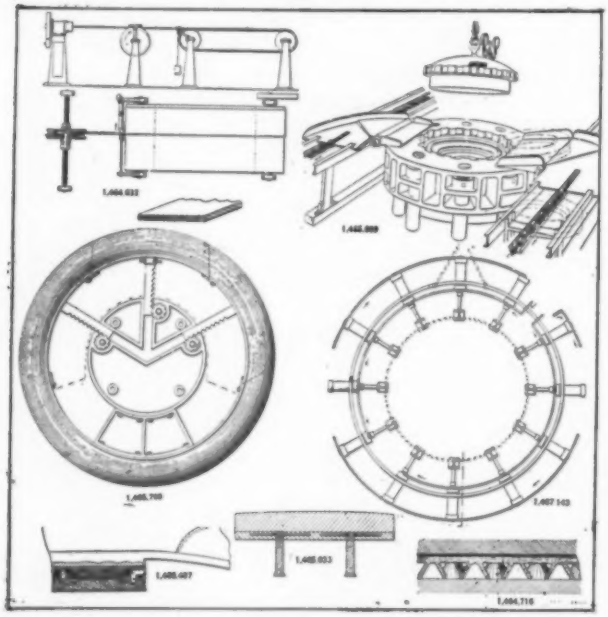
A slight clearance between the external and internal gears shown at F permits of a certain amount of error of alinement between the two shafts. The error, however, between the gear faces is only a small fraction of the corresponding error of alinement between the shafts due to the principle of this design.

The coupling is filled with oil to the supporting ring bearings H, and when the coupling revolves, the gear teeth are entirely submerged in oil under pressure due to centrifugal force, thus forming a constant oil cushion and eliminating wear of the gear faces.—The Bartlett Hayward Co., Baltimore, Maryland.

Machinery Patents

1,464,632. PROCESS OF EMBEDDING CORDS IN RUBBER. Herbert N. Wayne, Los Angeles, California. This process covers the coating of cords with a rubber or other plastic compound under pressure, thereby impregnating the fibers, and then laying lengths of this cord alongside each other while the coating is still plastic and in a condition to unite and form a single body or sheet of parallel cords embedded in rubber.

1,464,716. PNEUMATIC RUBBER BLANKET. Herman A. King, Portland, Oregon, and Edwin O. Isler, Hillsdale, Oregon. This relates to blankets used on web newspaper presses and similar machines. Its object is to provide a backing for the printing surface which



will continually come back to its original position the instant the impression is removed, utilizing the natural resiliency of the rubber and confined air to overcome defects in the stereotype plates.

1,465,033. RUBBER PAVING AND FLOORING BLOCK OR SLAB. William A. Williams, Edinburgh, Scotland. Blocks or slabs of rubber used for paving or flooring are provided with rigid metal projections extending downwardly through the lower rubber face of the block or slab, the rigid metal projections being sunk into the roadbed or foundation. If desired also the base or surface of the block or both the base and surface may be grooved or otherwise designed to afford a firmer foothold or attachment to the foundation.

1,465,609. CONVEYOR FOR VULCANIZING PRESSES. Colin Macbeth and Harry Willshaw, Birmingham, England. This invention provides for handling tire molds in or out of a vulcanizing press by mechanical means. Each mold is moved along a track towards the press and at a certain point deflected into it, thus enabling several molds to be supplied in quick succession to the press. After vulcanization, the superimposed molds are raised by the press ram and as each mold reaches a position slightly above the level of the top of the press, it is slid horizontally and directed onto another track along which it can be moved away.

1,465,769. COLLAPSIBLE TIRE BUILDING AND FINISHING CORE. Joseph R. Quin, Cudahy, Wisconsin. Heretofore it has been the practice to form the tire upon one core, remove it, and replace it upon a finishing core. This invention provides a core upon which the tire may be both formed and finished without removing it from the core. This is obtained by providing an accessible core which may be tilted and revolved and when the tire is completed, the core may be taken apart and withdrawn.

1,466,407. DETACHABLE RUBBER HEEL. William A. Maloney, Newton, Massachusetts. This relates to a rubber heel and particularly to improved devices for attaching it. The general object is to provide attaching devices of simple construction, so designed that they may be economical, reliable and easily attached or detached.

1,467,143. FABRIC RING STRETCHING AND APPLYING DEVICE. Harold A. Denmire, Akron, Ohio. A mechanical device by which flat frictioned fabric rings may be uniformly stretched to the required degree and applied to the core; the invention consisting in the construction and combination of parts.

Other Machinery Patents

The United States

1,463,528 Device for and method of manufacture of protected inner tubes for tires. A. E. Henderson, Toronto, Ontario, Canada.

1,463,529 Device for the manufacture of pneumatic tubes. A. E. Henderson, Toronto, Ontario, Canada.

1,463,868 Machine for covering tire rings. M. Brodeur, Providence, R. I.

1,463,872 Temperature indicator for tire repair vulcanizer. N. Conn, Minneapolis, Minn.

1,464,010 Tire-bundling machine. A. Miller, assignor to The American Rubber & Tire Co.—both of Akron, Ohio.

1,464,664 Method and apparatus for manufacturing combs and other toothed articles. H. Schelhammer, Whitestone Landing, N. Y., assignor to American Hard Rubber Co., New York, N. Y.

1,465,177 Tire stitcher. J. F. Richter, Hardin, Montana.

1,465,229 Casing trimming and lining machine. F. C. Moore, Canton, Ohio.

1,465,364 Repair vulcanizing tool. E. L. Petit, Moline, Ill.

1,465,552 Stitcher mechanism for tire-making machines. R. A. Holmes, Detroit, assignor to Morgan & Wright—both in Michigan.

1,465,611 Apparatus for laying reinforcing plates in the manufacture of tire liners. E. J. Moran, Chicago, Ill.

1,465,646 Contour caliper. H. V. Lough, Hartford, assignor to The Hartford Rubber Works Co.—both in Connecticut.

1,465,824 Apparatus for applying rubber outsoles to shoes. F. W. Hodges, assignor to Converse Rubber Shoe Co.—both of Malden, Mass.

1,466,009 Tire-tubing machine. H. A. Weidaw, Akron, Ohio.

1,466,079 Rimming press. T. H. Williams, assignor to The Adamson Machine Co.—both of Akron, Ohio.

1,466,101 Bias-flap stock cutting and applying machine. J. E. Perrault, assignor to Hood Rubber Co.—both of Watertown, Mass.

1,466,443 Apparatus for supplying a drying medium. C. E. Bradley, Montclair, N. J., and J. G. Coffin, Hempstead, N. Y., assignors to General Rubber Co., a corporation of New Jersey.

1,466,527 Tubular folding and collapsible core. A. J. Guiley, Hartville, Ohio.

The Dominion of Canada

233,297 Method of making tire casings. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of W. J. Steinle, Flushing, Long Island, New York, U. S. A.

233,298 Apparatus for making tire casings. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of W. J. Steinle, Flushing, Long Island, New York, U. S. A.

233,335 Mold for inner tubes. The T. B. McLeroth, Ltd., assignee of T. B. McLeroth—both of London, England.

233,336 Method of making inner tubes. The T. B. McLeroth, Ltd., assignee of T. B. McLeroth—both of London, England.

233,669 Apparatus for deflating tubes. The Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ontario, Canada, assignee of H. D. Stephens, Akron, Ohio, U. S. A.

233,852 Cast steel tire mold. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of J. H. Mulloy, Detroit, Michigan, U. S. A.

233,854 Cementing machine. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of T. B. Huestis, Bristol, Rhode Island, U. S. A.

233,871 Feeding apparatus for cutting machines. The Dunlop Rubber Co., Ltd., Regent's Park, County of London, assignee of W. B. Monk, Birmingham, County of Warwick—both in England.

The United Kingdom

198,710 Method of molding hot water bottles. H. B. R. Clarke, Lincluden, Radlett, Hertfordshire, H. Skellon, Fielding Mills, Middleton, Lancashire, and T. H. Roberts, Isbells, Reigate, Surrey—all in England.

198,715 Method of making golf balls. Dunlop Rubber Co., Ltd., Regent's Park, London, and A. E. Penfold, Manor Mills, Salford street, Aston, Birmingham—both in England.

198,791 Apparatus for making incisions in tires. J. F. Sipe, 127 W. 43rd street, New York, U. S. A.

199,423 Feeding and winding webs. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and W. B. Monk, Fort Dunlop, Erdington, Birmingham—both in England.

199,746 Injection process of making dental plates. C. Joannides, 36, Place de l'Ambassade d'Angleterre, Constantinople, Turkey.

200,022 Endless chain stitcher for tire building machine. A. E. White, 88 Chancery Lane, London. (Norwalk Tire & Rubber Co., Norwalk, Connecticut, U. S. A.)

Germany

Patents Issued with Dates of Issue

381,397 (March 9, 1922). Vulcanizing apparatus. William James Bowker, Birmingham, England; represented by H. Neubart.

381,898 (January 4, 1922). Device for use in the manufacture of tire casings. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil and M. M. Wirth, of Frankfurt-am-Main.

381,899 (January 4, 1922). Pressure device for the manufacture of tire casings. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil and M. M. Wirth, of Frankfurt-am-Main.

381,936 (July 24, 1920). Apparatus for molding and vulcanizing rubber tires. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S.W. 11.

381,970 (June 11, 1920). Apparatus for making solid rubber tires. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S.W. 11.

381,971 (April 26, 1921). Apparatus for making combs of horn and similar substances. Simeon Azema-Bigon, Camprédon, France; represented by Dr. A. Levy and Dr. F. Heinemann, Berlin, S.W. 11.

382,165 (January 4, 1922). Pressure device for use in the manufacture of pneumatic tire casings against that part of the casing resting on the case. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil and M. M. Wirth, all of Frankfurt-am-Main and Kochnhorn and Noll of Berlin, S.W. 11.

382,213 (January 3, 1922). Device for conveying cut strips for tire casings. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil and M. M. Wirth, all of Frankfurt-am-Main and Kochnhorn and Noll, of Berlin, S.W. 11.

382,779 (December 7, 1920). Mechanism for making cellular pneumatic tires. T. B. McLeroth (Tubes), Limited, London; represented by F. Schwenterley, Berlin, S.W. 11.

Germany

Design Patents Issued with Dates of Issue

850,054 (June 11, 1923). Rubber sole press. Hugo Klinghammer, Schwelm.

850,093 (May 4, 1923). Safety bicycle valve cap. Alwin Klein, Artlenburg, Elbe.

850,195 (June 12, 1923). Tire valve. Firma Hans Landsberger, Berlin.

850,536 (June 18, 1923). Tire repair device. Dr. Wilhelm Knöll, Treskowstrasse 66, Berlin-Mederschönhausen.

850,780 (June 22, 1923). Stretching hoop of aluminum for vulcanizing defective inner tubes as well as other soft rubber goods. Fritz Schwarz and Willi Schwarz, Staaken.

850,868 (October 11, 1922). Mixing machine. Bohner & Köhle, Esslingen a.N.

850,902 (November 30, 1922). Vulcanizing apparatus. Walter Kirkbank Fletcher and John Rushmer, London; represented by Arthur Kuhn, Berlin S.W. 61.

851,034 (February 28, 1923). Press for stamping bodies out of rubber or similar masses. Continental Caoutchouc and Gutta-Percha Compagnie, Hannover.

851,450 (July 2, 1923). Spray head for tubing machines. Hubert Bilek, Corbach i. Waldeck.

851,483 (May 12, 1923). Ring for attaching tires and the like. Franz Clouth, Rheinische Gummiwarenfabrik A.-G., Köln-Nippes.

851,597 (July 4, 1923). Tire valve. Karl Prokop, Vienna; F. A. Hoppen, Berlin S.W. 68.

851,599 (July 5, 1923). Connection between felly and rubber tire for baby- and invalid-carriage wheels. Hubert Bilek, Corbach i. Waldeck.

851,725 (June 22, 1923). Device for attaching rubber heels. Bruno Künzel, Glockenstrasse 3, Chemnitz.

852,271 (September 10, 1920). Mold for making and vulcanizing solid tires. Enrico Frattini, Darmstädterstrasse 8, Berlin.

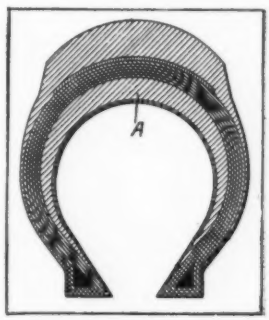
Process Patents

Rubber Footwear

An article of footwear consisting of a layer or layers of relatively soft rubber in contact with a layer of relatively less elastic rubber compound, containing as an essential ingredient between 50 and 100 parts by weight of finely divided carbon to each 100 parts by weight of crude rubber in the compound.—William B. Wiegand, Montreal, Canada, United States patent No. 1,465,504.

Puncture-Proof Inner Tire Tread

A construction for insertion in ordinary pneumatic tires to render them less liable to punctures, blowouts and rim cutting is here represented in cross-section.



Pneumatic Tire Protector

It is essentially an inner tread made of rubber composition, having a relatively thick central portion, A, tapering to thin edges at the base, and lined with a ply of building fabric. It is molded and cured to semi-hardness so that although it has a limited degree of flexibility and resistence it is considerably harder and less flexible than the outer tread of a tire.

The semi-hardness of the inner tread not only minimizes liability of puncturing the tread and inner tube within the shoe but also eliminates liability of rim cuts and blowouts.—William E. Powers and Martin F. Hannigan, of Boston and Watertown, Massachusetts, respectively. United States Patent No. 1,456,908.

Other Process Patents

The United States

1,463,754 Method of manufacturing tires. C. E. Rett, Akron, assignor to Lambert Tire & Rubber Co., Barberton—both in Ohio.

1,463,987 Mode of manufacturing inner tubes. W. W. Wildman, assignor to the Wildman Rubber Co.—both of Bay City, Michigan.

The Dominion of Canada

233,186 Process of uniting vulcanized rubber and a phenolic condensation material. H. L. Duncan, Edgewood, assignee of H. C. Egerton, Maplewood—both in New Jersey, U. S. A.

233,189 Anti-skid tread for tires. The Racine Auto Tire Co., assignee of C. Wright—both of Racine, Wisconsin, U. S. A.

233,505 Air bag process. K. J. Thompson, Mansfield, Ohio, U. S. A.

233,542 Method of preparing a tread solid tire. The Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ontario, Canada, assignee of D. E. Goodenberger, Akron, Ohio, U. S. A.

233,831 Deflector for plate feeding mechanism. E. C. Pool, New Castle, Pa., U. S. A.

233,853 Method of making rubber mats. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of W. J. Kent, Brooklyn, New York, U. S. A.

The United Kingdom

198,408 Process of making golf balls. W. G. Morris, 74 Merton road, Wimbledon, London, England.

Germany

Patents Issued with Dates of Issue

381,394 (November 26, 1921). Connecting the bearing plate spring with the under frame by means of rubber blocks, especially for motor vehicles. International Motor Co., New York; represented by G. Benjamin and H. Wertheimer, Berlin S.W. 11.

381,558 (August 16, 1922). Method and apparatus for making strong cord fabric. Hermann Debor, Zielstattstrasse 55, Munich.

381,834 (June 4, 1921). Method of working a spreading machine. Ernst Hurlbrink, Bachstrasse 2, Berlin.

381,937 (May 6, 1922). Method of vulcanizing rubber layers of thin-walled hollow bodies of larger size. Felton & Guilleaume, Carlswerk, A.-G., Köln-Mülheim.

382,349 (July 10, 1920). Method of making tire bodies. Ernest Hopkinson, New York; represented by R. H. Korn, Berlin S.W. 11.

Activities of the Rubber Association of America

Division and Committee Meetings

THE Specification Committee of the Mechanical Rubber Goods Manufacturers' Division met in Akron, Ohio, September 10. The committee devoted most of its time to the formulation of plans for the coming year and discussed the requirements issued by individual railroads and government departments for mechanical rubber goods.

The Service Managers' Committee of the Tire Manufacturers' Division held a two-day meeting in New York City on September 13 and 14. The major part of the committee's time was given over to the preparation of a pamphlet on truck tires similar to the one on pneumatics, entitled, "The Care of Pneumatic Tires."

The Traffic Committee met on September 13 in New York City, when railroad rate and classification questions pertaining to rubber goods were discussed.

The Executive Committee of the Rubber Sundries Manufacturers' Division met on the evening of September 18 at the Union League Club, New York City. Problems of the trade were discussed and the reorganization of the division to more closely embrace the diversified lines usually classed with rubber sundries was considered.

The Accounting Committee met on Friday, September 21, and formulated new plans for the progress of its work in the development of uniform cost accounting principles for the rubber manufacturing industry.

The Foreign Trade Division met in Akron, Ohio, September 25, and considered questions of a routine nature connected with the work of that body.

The Executive Committee of the Mechanical Goods Division met in New York City on September 26. One of the subjects considered was the standardization of garden hose on the basis of the ⅝-inch size, eliminating the ¾- and ½-inch sizes.

The Executive Committee of the Tire Manufacturers' Division met in New York City on September 26 and discussed a number of important questions relating to that trade.

The Board of Directors met at the Lotos Club, New York City, on September 27 and considered problems pertaining to the organization and operation of the association.

Statistics Compiled from 1923 Questionnaire Covering the Second Three Months of 1923[1]

Reclaim and Scrap	Reported by Manufacturers Who Also Reclaim (25)	Reported by Reclaimers Solely (6)	Total
Number of pounds reclaimed rubber produced from raw and cured scrap	16,961,976	16,676,565	33,638,541
Number of pounds scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber	24,995,591	21,859,009	46,540,412

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

Product	Number of Pounds of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and tire sundries:		
Automobile and motor truck pneumatic casings	104,611,372	$112,515,398
Automobile and motor truck pneumatic tubes	23,913,971	17,214,249
Motorcycle tires (casings and tubes)	281,970	434,838
Bicycle tires (single tubes, casings and tubes)	753,420	1,301,075
All other pneumatic casings and tubes, not elsewhere specified	17,415	4,768
Solid tires for motor vehicles	14,998,567	8,237,594
All other solid tires	135,396	208,141
Tire sundries and repair materials	1,455,680	2,902,708
Totals—Tires and tire sundries	146,167,791	$142,818,771
Other rubber products:		
Mechanical rubber goods	10,762,572	$24,280,619
Boots and shoes	9,665,831	29,522,711
Insulated wire and insulating compounds	2,010,079	9,066,147
Druggists' sundries, medical and surgical rubber goods	1,585,429	3,884,369
Waterproof cloth, clothing, and rubber sheeting	1,875,442	6,674,264
Hard rubber goods	1,675,674	2,569,517
Heels and soles	3,467,227	3,957,866
Miscellaneous, not included in any of above items	3,210,248	5,133,484
Totals—Other rubber products	34,252,502	85,088,977
Grand total—All products	180,420,293	$227,907,748

[1]Number of rubber manufacturers that reported data was 232; crude rubber importers and dealers, 40; reclaimers (solely), 6; total daily average number of employes on basis of third week of June, 1923, was 163,902. With the exception of the crude rubber inventory at 95 per cent, the figures are believed to represent approximately 90 per cent of the United States rubber industry.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	Pneumatic Casings				Inner Tubes				Solid Tires			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
1922												
July	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275
November	62	4,964,976	2,733,134	2,379,708	61	6,210,053	3,850,908	3,075,023	11	234,684	85,775	61,466
December	59	4,599,208	2,656,942	2,934,079	59	5,732,125	3,411,074	3,825,949	10	244,061	77,221	64,570
1923												
January	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,343	60,611
February	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609
May	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June	55	7,040,600	2,956,943	2,502,185	54	8,924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July	54	6,471,124	1,992,989	2,539,425	52	7,396,444	2,625,118	3,942,247	10	263,891	42,345	45,219

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse branch, or on a consignment basis, or abroad.

Compiled by The Rubber Association of America, Inc.

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR U. S. PORTS, JUNE 30, 1923

ON HAND	Long Tons		
	Plantation	Pará	All Other
Manufacturers	73,210	4,513	1,455
Importers and dealers	19,959	1,173	575
Totals	93,169	5,686	2,030

Grand total—On hand, 100,885

AFLOAT	Long Tons		
	Plantation	Pará	All Other
Manufacturers	12,798	86	...
Importers and dealers	14,684	277	145
Totals	27,482	363	145

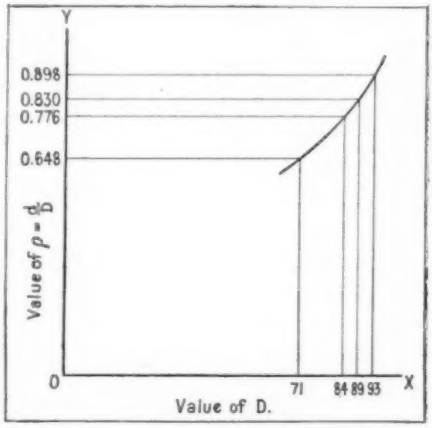
Grand total—Afloat, 27,990

Determination of Die Sizes for Tubes

By R. Alajouanine [1]

Every tubing machine operator is familiar with the fact that, on leaving the die, rubber stocks swell or enlarge to a cross-section greater than that of the die and different in amount for varying qualities of rubber mixing. The proper proportion of die to use for a given thickness of wall and size of tube can be figured by the following plan:

Let s represent the area of the passage through the die and S the value of the tube cross-section. The ratio of $s \div S$ is a function (1) of the quality of the rubber composition; (2) of the pressure exerted upon the rubber as it leaves the die and consequently of the power of the machine at the die opening; (3) of the physical condition — plasticity—of the rubber.



Curve Showing the Value of d Compared to D

To determine experimentally the corresponding relations between s and S the following conditions were observed: (1) The rubber composition was held constant; (2) the feed and delivery of the rubber were kept constant and the feed was made as uniform as possible. Under these conditions the discharge from the machine was constant for a given diameter of die.

The following table was derived from actual measurements and shows that the ratio $s \div S$ is constant, equal in this case to 0.43. Variations from this value are due to inaccuracies of measurement.

TUBES			DIES			RATIO
Diameter D mm.	Wall E mm.	Section S mm.²	Diameter d mm.	Annular Opening e mm.	Section s mm.²	$k = s \div S$
71	6	1,337	46.0	4	578	0.439
84	6	1,580	65.25	3.25	666	0.421
89	6	1,677	75.9	3.1	738	0.440
93	6	1,752	83.6	2.9	761	0.434

From this table it is concluded that, for the same tubing machine and given rubber mixing, if the section s of the die varies and the other conditions remain constant the ratio $s \div S$ is constant and can be determined for all the mixings employed. Knowing S for any tube desired, and the ratio k or coefficient of the mixing, one can determine at once the section s of the die required, by the formula (1) $s = k$ S. Substituting for s and S their component values $d\ e$ and D E the above formula may be written $d\ e = k$ D E.

Thus to each system of values D and E there are corresponding values of d and e. By plotting values of D as abscissæ and values $d \div D = \rho$ as ordinates a curve has been obtained showing the value of d corresponding to that of D.

From the two preceding ratios we obtain the annular section $e = s \div r\ d$.

To ascertain how d varies when D and E also vary one should determine in addition to the case above explained, the variations of d when E varies and D remains constant, and from comparisons of these two sets of values figure the data for practical use.

[1] Designing engineer, Société Anonyme des Pneumatiques Dunlop, Montluçon, France.

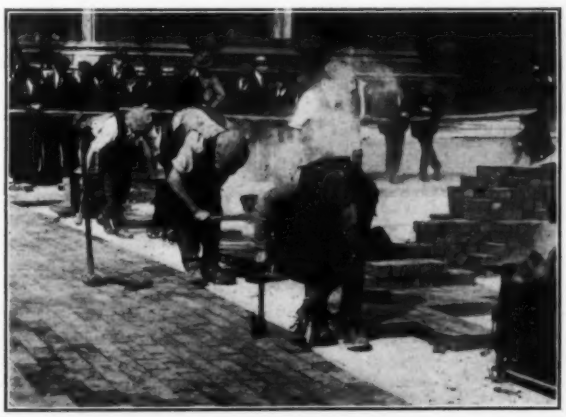
CRÊPE RUBBER SOLES BECOME INCREASINGLY POPULAR

Crêpe rubber soles are becoming more and more used for all kinds of sport shoes, and they have also been found most practicable for wear by nurses in hospitals and by workmen subjected to damp and wet working conditions.

Only the best material, however, must be used for manufacturing purposes. Few shoemakers realize that only about 15 per cent of the rubber produced is fit for crêpe soles. Also, one grade of crêpe sole will not do for all types of sport shoes, any more than one grade of leather can cover all grades of shoes. In general, the crêpe sole is steadily becoming more popular because it has a springiness and resiliency that no composition sole has heretofore possessed, while the softness and light weight of shoes equipped with crêpe soles add much to the user's comfort. Long wear and non-slip qualities are still other advantages that appeal to those requiring various kinds of sport shoes.

Many manufacturers and jobbers who condemned the crêpe sole on its first appearance, without a fair trial, are now gradually giving their support to it. Many of these manufacturers have had excellent results in getting crêpe soles properly attached to their shoes; others through careless workmanship and poor leather slip soles, have had their share of troubles. Some have tried to use cheap slip soles and poor cement, and so save a few cents per pair on the shoe. It is needless to say that such methods have resulted only in loss. Reliable rubber manufacturers are now turning out crêpe soles guaranteed and branded with their own trade marks, and furnishing instructions regarding improved methods of attachment to those desiring such information. The crêpe sole has evidently come to stay.—*Shoe and Leather Facts.*

RUBBER PAVEMENT AROUND LONDON'S CENOTAPH



The proposed rubber pavement around the Cenotaph, London's memorial to her soldier dead, was mentioned in recent issues of THE INDIA RUBBER WORLD. The accompanying photograph represents the workmen actually engaged in laying this "zone of silence," the expense being borne by Rubber Roadways, Limited.

New Goods and Specialties

Another Design of Sponge Rubber Doll

THE approaching holiday season is bringing out new designs in sponge rubber toys. The accompanying illustration shows one of the latest dolls of the type which has proved so popular recently. — The Miller Rubber Co., Akron, Ohio.

Miller Sponge Rubber Doll

Decorative Designs for Rubber-Backed Apron Materials

Great demand is reported for aprons of rubberized materials in attractive designs. They are made up in a variety of textures, including vivid cretonnes, percales in flowered, checked, and striped patterns, and even in hairline dimities. One dainty fudge model is made of dimity scalloped around the edges and finished with flowered bias binding. There are also models of this type in black sateen.—W. H. Dean & Co., 45 East 17th street, New York, N. Y.

Commercial Trailmaker Cord Tire

The tire illustrated is made only in 30 by 3½ clincher type and is especially for commercial service, being built to withstand the hard usage such tires receive. It is the maximum cord size and the fluting at the edge, designed to give additional protection at that point, makes it seem even more massive than it is. The carcass is composed of four plies of 15 2/10 ounce long staple cord fabric and is of the same construction and composition as the company's regular 30 by 3½ Clincher Trailmaker.—The Spreckels "Savage" Tire Co., San Diego, California.

Commercial Size Trailmaker

Embroidered Monograms for Gaiters

The popularity of monograms for decoration on clothing is expected to augment the sale of arctics and gaiters for women and children during the coming winter. Retail merchants are considering the suggestion. Silk woven label letters may be had for one cent each or a more artistic and consequently higher priced effect may be obtained through the hand embroidered initial. As a means of identification and of avoiding mistakes as to ownership, especially in schools or where numbers of people congregate, much might be said in favor of the plan.

THE RAWSON MOULDING CO., WALTHAM, MASSACHUSETTS, makes a vacuum tube socket for radio, constructed of bakelite, designed for panel mounting, with nickeled metal parts.

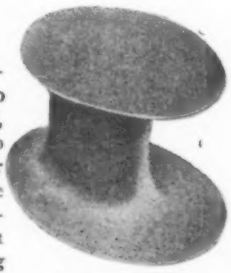
Reinforced Asbestos Piston Seal

The illustration shows a flexible packing of long fiber asbestos substantially reinforced, which is used to pack the space between the piston ring and the bottom of the piston groove, thus eliminating piston slap and ring slap. When the groove is thus packed, the ring is prevented from collapsing in the groove and the piston is effectually sealed so that gasoline cannot possibly leak through into the crank case.—General Asbestos & Rubber Co., Charleston, South Carolina.

"Ringpak" Piston Seal

Sponge Rubber Device for Cramped Toes

A small item of interest to the druggists' sundries trade as well as to shoe dealers is the device illustrated, called "Adjus-toes." It is designed to correct cramped toes, Morton's toe, or hammer toe, is made of soft sponge rubber and fits between the toes without interfering in any way with the fit of the shoe, while actually contributing to the comfort of the wearer.—Thompson-Barlow Co., Inc., New York, N. Y.



Sponge Rubber "Adjus-toes"

Waterproof Spats for Wet Weather Cycling

A combination legging and spat has a leather pocket into which the toe of the shoe fits, thus holding the spat snugly in place and preventing it from flapping back and allowing rain or slush to get to the lacing holes. It is made in sizes for men and women and is of waterproof material which fastens around the leg by means of elastic bands and snaps. Two patterns are provided, one of which covers the knee, the other just reaching the knee. Only a few seconds are required to adjust the "cyclospats" and they may be folded into a parcel small enough to fit into one's pocket.—Brown Brothers, Limited, Great Eastern street, London, E. C. 2, England.

"Cyclospats" for Muddy Days

BRILL BROTHERS, BROADWAY AT 49TH STREET, NEW YORK CITY, are agents for women's "Holeproof 'Stockingettes'" of glove silk and sheer silk in ten colors, with self-contrasting colored garter tops, manufactured by the Holeproof Hosiery Co., Milwaukee, Wisconsin.

Rubber Lift for Wooden French Heels

In the rubber lift for the wooden heel shoe, shown in the illustration, the special feature is the one-screw hole, which when supplemented by the use of three to five brads presents a very neat appearance and a very secure joining. It is one of the company's "Double Wear" products and may be applied directly to all types of wooden heels, French, Spanish, Cuban, or military.—Dryden Rubber Co., 1014 South Kildare avenue, Chicago, Ill.

"Double Wear" Heel

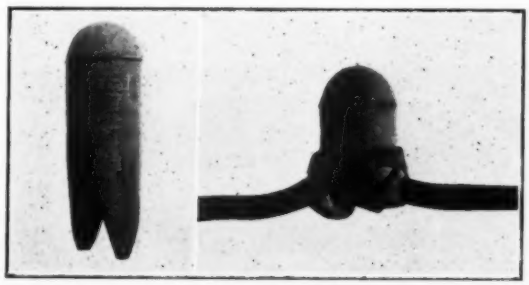
A New "O'Sullivan" Repair Product

The name of O'Sullivan has been so long advertised in connection with the company's rubber heel that importance is attached to the consumer good will which is due to greet the rubber sole which the company is now marketing. These soles are called "O'Sullivan Taps" and are described as being all-rubber, tough and long wearing, bending easily with the foot but hard enough to prevent the wearer from feeling the pebbles, etc., under foot. They take stitching well and are easily applied, reinforced nail holes at the base serving to prevent nails from pulling through.—O'Sullivan Rubber Co., Inc., 131 Hudson street, New York, N. Y.

"O'Sullivan Taps"

Rubber Cap Joint Insulator

The "Rub-Cap" insulator illustrated is made in different sizes and in two distinct forms. One form is Pará lined and has the lower part of the aprons vulcanized together, leaving slits on each side that will permit of the cap being threaded on one of the wires to be jointed, and stretched over the same after the joint is made. A tin tubulus is employed on the larger caps so that when twisted in a certain manner a secure and rigid joint is obtained



"Rub-Cap" Insulator

and there is no possibility of reaction between the sulphur and copper. In the second form of the Rub-Cap, the cap is fitted over the joint and the aprons enlaced in the manner pictured.—The Simplex Electric Co., 54 Sandy Park road, Brislington, Bristol, England.

The Dandee Tube Patch

The simplicity of application is one of the principal sales features of the Dandee Tube Patch. The tube is placed over the front fender of the car and the surface around the place to be repaired is thoroughly buffed. Dandee cement compound is worked into the pores and the patch is applied. Not more than two minutes are consumed in the operation, as the material is self-vulcanizing.—Dandee Patch Manufacturing Co., Cleveland, Ohio.

Felt-Covered Rubber Ball

A variation of the rubber play ball is covered in bright contrasting colors in felt, making it an attractive toy and giving it an agreeable "feel." It has an excellent bounce and is in sizes convenient for kiddie hands.—The Barr Rubber Products Co., Sandusky, Ohio.

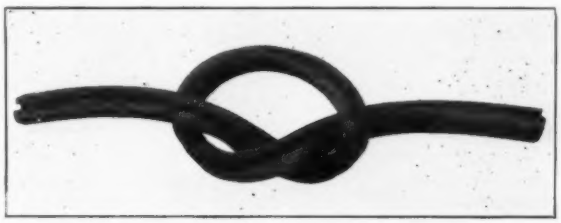
Nursery Play Ball

Rubberized Shampoo Bib

A shampoo bib which is proving satisfactory to the beauty parlors is marketed by Julius Pauly, Inc., 36 East 21st street, New York, N. Y. It is made of rubberized material and protects the clothing of the customer and the hair-dresser during shampooing or hair dyeing operations.

Rubber Channel for Glass in Automobile Bodies

The Sphinx glass run channel illustrated is constructed of velvet, felt, or other textiles, with an inner cushion of live rubber. It has converging side walls and will admit any standard thick-

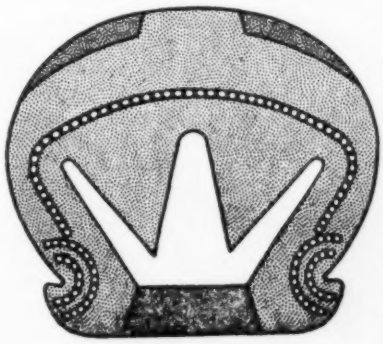


The "Sphinx" Glass Run Channel

ness of automobile window glass. The textile covering protects the rubber from the effects of light and atmospheric conditions and its close adhesion to the rubber prevents the run from becoming frayed. The device is easy to install and is dust and waterproof.—Detroit Rubber Products, Inc., Detroit, Michigan.

Puncture-Proof Tubeless Tire

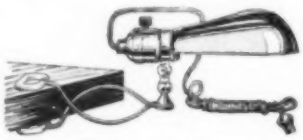
The tire illustrated is built to stand up under the predetermined weight of the car to which it is to be fitted. It requires no inner tube, but contains in itself sufficient air to absorb ordinary shocks. Under extraordinary shocks the projecting ribs seat against the sidewalls, preventing collapse of the tire at the point of contact with the obstacle over which it is passing. The action is said to be like that of a spiral spring. The movements flex the ribs, forcing contraction of the ribs facing the side channels, at the same time forcing expansion of the ribs facing the middle channel, thus increasing tension and resistance until the ribs seat against the sidewalls. The tire may be fitted to trucks as well as pleasure cars, and the inventor claims that it will reduce expense and waste and will combine the easy-riding qualities of air tires with the sureness of solid tires.—Andrew J. Weigand, 811 North Calvert street, Baltimore, Maryland.



"Aye Trouble-less" Flexible Tire

Extension Light with Rubber Covered Clamps

A new attachment for portable electric lights has a rubber-covered adjustable spring grip by means of which it can be fastened anywhere there is sufficient surface to furnish a grip hold. The lamp is equipped with a double swivel joint so that it may be turned and adjusted to throw the light just where it is needed.—A. B. Stewart & Co., 219 West Huron street, Chicago, Illinois.



The Grip-o-Lite

Rubber Wool Winder

The inflatable flexible core illustrated is used for winding a ball of wool, string, crochet thread, etc., so that the material may be unwound from the center. Inflating the core makes it possible to wind the wool into a perfect ball and yet have it loose as desired when the core is deflated and withdrawn.—Reliance Rubber Co., Limited, 212-13 Upper Thames street, London, E. C. 4.

Rubber Core Inflated and Deflated

Improved Fruit Jar Ring

The addition of ears to a fruit jar ring, as shown in the accompanying illustration, gives the ring a two-fold purpose. It not only insures airtight closing but facilitates opening, and prevents soiling the fingers when the top is removed. The rings are well advertised and should prove a profitable item for retailers.—Cupples Co., St. Louis, Mo.

"Presto Magic Opener" Fruit Jar Ring

Crêpe Sole Inset for Leather Shoes

The chief value of the shoe shown in the accompanying illustration lies in the fact that it combines the comfort and service of the sports shoe with the conventional appearance of the all-leather shoe. The crêpe rubber sole is not visible when the wearer is standing or walking, yet it is there to prevent the foot from slipping from the pedal when cycling or to insure springiness and comfort on a hike or to make it possible for one to go directly from the business office to the links if a change to the regulation golf shoe is not convenient.—Hornby & West, Limited, Wycliffe Road, Northampton, England.

The "Ubique" Patent Process Shoe

The Latest Hood Tire

The Hood White Arrow Cord combines all the qualities of the extra ply fabric tire, which, according to the manufacturers, insures greater resiliency, easier riding, and less danger resulting from under-inflation than is to be had with ordinary cord construction. In addition the new tire features a massive flat tread piled up on the tire where the wear is greatest, which means increased traction and greater non-skid properties.—Hood Rubber Products Co., Watertown, Massachusetts.

Hood White Arrow Cord

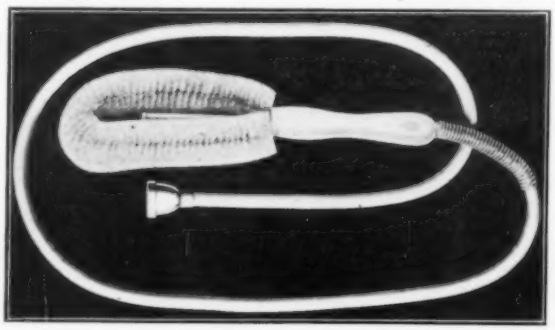
Rubber Protector for Food Cells

A light, inexpensive cover designed to prevent leakage so that a food cell may be carried in the handbag safely or put aside without danger of contamination from dust or odors, is made of rubber, flat and without an opening, as illustrated. It is constructed to fit any type of Hygeia food cell or nursing bottle, as all sizes of the cells are uniform at the top. Bottles on which these covers fit are also supplied to be furnished the milkman so that there may be no possibility of contamination of the milk between the dairy and the home. —The Hygeia Nursing Bottle Co., Inc., 1206 Main street, Buffalo, New York.

Bottle Cover

Fountain Bath Brush

To the well-known line of Fuller brushes has been added a fountain spray which carries the tube connection from the faucet up through the handle of the brush and the part holding the bristles, which is perforated to allow the water to escape over the bristles.



Fuller Fountain Spray

Thus a shower with friction is provided, combined with the special feature, the long reach of the brush, made possible by its shape and the length of the rubber tubing.—The Fuller Brush Co., Hartford, Connecticut.

THE "RADIO" PLAY BALL, 12 TO 15 INCHES IN DIAMETER, IS OF the molded inflated type, is guaranteed for one year, and will be reinflated at any time by the manufacturer, the Radio Ball Co., Lebanon, Pennsylvania.

Plantation Rubber Arrivals Compared With Stocks and Consumption

By Fred T. P. Waterhouse

LAST March the writer was quoted by the press to the effect that unless the rate of consumption, which has since been reported by the Rubber Association as 96,774 tons for the first three months, decreased, that there would be a shortage of rubber within the year. The consumption of 96,774 tons for three months is at the rate of 387,096 tons for the year, or 87,096 tons or more in excess of what is likely to be consumed in 1923.

My statement, therefore, has proved to be correct, but at that time it was difficult for our friends across the water to realize what a large amount of rubber this country was consuming. The *Straits Times* in commenting on my statement said, "If it was quite reliable it would be the most consoling bit of news we have had for ages, and we would undertake to control the shortage as soon as we had got a little of our own back."

It is equally difficult for producers to realize that there has been a sudden decrease of forty per cent in rubber consumption. When there is a sudden large increase in consumption there is an extra demand for larger stocks on hand, but when consumption suddenly drops, as in the present case, three months' supply of stocks becomes five months' supply.

In the following statements I have compared stocks and consumption with arrivals in consuming markets, and in estimating arrivals I have taken the exports from primary markets from November 1, 1922, to October 31, 1923.

Many of the figures of net exports from Malaya that I have seen are computed by deducting the imports from the gross exports. This is not correct as most of the imports are wet rubber from native plantings. This rubber is remachined and made into ambers in Singapore before being exported, with a shrinkage loss which will amount to eight or ten thousand tons for the year. Taking this shrinkage into consideration decreases the figures of imports and increases the net exports by the same amount.

The arrivals for the first six months of this year show that the bulk of exports from primary markets found its way into the United States, leaving only 25,837 tons for other world's markets. This amount, together with the 24,132 tons decrease in London stocks during the same period, was, therefore, the amount absorbed by the rest of the world.

Regarding the consumption figures for the first six months of this year I have assumed that the stocks in the hands of manufacturers who did not report to the Rubber Association did not increase or decrease materially between January 1 and June 30. I have added 5,200 tons to the consumption figures to allow for stocks, such as distress rubber, etc., consumed during the first six months. This would make the reported consumption roughly 94 per cent of the actual.

ARRIVALS IN CONSUMING MARKETS, JANUARY TO JUNE, 1923

SHIPMENTS FROM PRIMARY MARKETS FROM NOVEMBER 1, 1922 TO APRIL 30, 1923

From		Tons
British Malaya, net		105,000
British Malaya (imports reexported), mostly Dutch rubber, total imports, 28,700 tons, less moisture extracted, 3,200 tons (estimated)		25,500
Java		17,739
Sumatra		21,684
Ceylon		22,986
Indo-China, imports for 5 months (actual)		1,355
Indo-China, one month (estimated)		271
India		2,258
Wild sources		14,970
Total arrivals, January to June		211,763
Imports into the United States, retained		185,926
Leaving balance absorbed by rest of world		25,837
London stocks January 1	79,564	
London stocks June 30	55,432	
Decrease absorbed by rest of the world	24,132	24,132
Total tonnage absorbed by rest of the world		49,969

Stocks

United States stocks on hand January 1, 1923

In manufacturers' hands		71,894
In dealers' hands		17,865
Total		89,759
Imports retained January-June		185,926
Total available stocks		275,685
Less stocks reported on hand June 30		100,885
Total stocks		174,800

Consumption

Consumed during January-March as reported to the Rubber Association	87,000	
Consumed during April-June as reported to the Rubber Association	80,544	
Balance not reported	7,256	174,800
Estimated decrease in stocks held by factories and others not reporting to the Rubber Association		5,200
Estimated U. S. consumption, January-June, 1923		180,000

Regarding consumption for the second half of the year it is the general opinion that consumption of crude rubber in this country has fallen off forty per cent, and the average consumption for the period will not exceed sixty per cent of the consumption for the first six months. In order to be on the conservative side I have taken the consumption at 66⅔ per cent or two-thirds of what it was for the first six months. The imports of native rubber into Singapore for the last six months show an increase over the first six months.

ARRIVALS IN CONSUMING MARKETS, JULY 1 TO DECEMBER 31, 1923

SHIPMENTS (PARTLY ESTIMATED) FROM PRIMARY MARKETS FROM MAY TO OCTOBER, 1923

		Tons
British Malaya net exports (maximum allowed under restriction)		85,600
British Malaya, 88 per cent of imports reexported		29,677
Imports May-August	22,724	
Imports September-October, estimated	11,000	
Total imports (about 80 per cent wet native rubber)	33,724	
Less shrinkage	4,047	
Imports, Malaya	29,677	
Java:		
May-June exports	5,475	
July-October exports, estimated	12,054	17,529
Sumatra East Coast Residency exports:		
May and June exports		6,241
July-October exports, estimated		14,242
Ceylon maximum exports allowed under restriction		18,750
Indo China		1,626
India		2,258
Wild sources		15,000
Total estimated arrivals July-December		190,923
Add stocks on hand July 1 in London		55,432
Add stocks on hand July 1 in New York and United States		100,885
Total estimated arrivals and on hand		347,240

Consumption

United States consumption estimated at 66⅔ per cent of January-June consumption of 180,000 tons	120,000
	227,240
Rest of the world (same as January-June)	49,969
Estimated London and United States stocks on hand Dec. 31, 1923	177,271
Stocks on hand at the end of June in the United States amounted to 3⅓ months' supply based on the January-June rate of consumption. On the basis of 120,000 tons consumption for July-December, and taking four months' supply as the requisite to be carried for normal stocks, we should have on December 31—	
Normal stocks in the United States	80,000
Normal stocks in London	40,000
Surplus distributed between the United States and London	57,271
Total	177,271

The Obituary Record

One of Brazil's Best Known Rubber Men

DR. Jose Simao da Costa, of Pará and Rio de Janeiro, Brazil, one of the most widely known rubber men of South America, died June 10, 1923, in Rio de Janeiro of paralysis complicated with pneumonia. His death was a shock to his many friends.

It was as a member of the Alves Braga Estates & Trading Co., one of the leading rubber export houses of Pará, with a European office and important trading connections in the United States, that Mr. Da Costa first came to the notice of the rubber men of the world. As an inventor he soon attracted further attention, his principal patents covering machinery for the coagulation of latex, and for the washing, purifying and smoking of rubber.

J. Simao Da Costa

With more foresight than most of his countrymen Mr. Da Costa realized that Brazil must go energetically into plantation rubber if she would maintain her supremacy among the world's rubber producers. In 1912 he lectured on this subject at the Engineers' Club in Rio de Janeiro, largely as the result of which the Brazilian Government promulgated laws offering prizes for the planting of rubber and the establishing of experimental stations throughout the rubber regions. Just when a start was being made, however, financial difficulties arose and the war soon made impossible any further attempts in that direction.

As the representative of Dr. Pedro de Toledo, late Minister of Agriculture of the Federal Government of Brazil, at the Congress for the Economic Defense of the Amazons, held at Pará in 1913, Mr. Da Costa also spoke in similar vein. He also represented the Government of Pará at the Rio de Janeiro Rubber Exhibition in October of that same year and was a member of the jury.

The comprehension he displayed in discussing the great national problems in Brazil, which must be solved before her rubber, cotton and fibers can become of greater commercial importance, gave authority to his numerous writings and public addresses. Three of his books, published in 1922, are "O Coqueiro" (the Coconut Tree), "Pomicultura Tropical" (Tropical Fruit Growing), and "Plantas Fibrosas" (Fibrous Plants).

In addition to his rubber interests, Mr. Da Costa was an actuary of the Garantia da Amazonia Life Assurance Society of Pará. He was a member of the Engineers Club of Rio de Janeiro, of the Chamber of Commerce of Rio de Janeiro and of London, England, also of the American Chamber of Commerce for Brazil. In recognition of services rendered to Portugal in the Republic of Brazil he was made a "Knight of the Military Order of Nossa Senhora de Villa Vicosa" by the late Don Carlos I of Portugal.

In the death of Mr. Da Costa Brazil loses one of her greatest economists and men of practical imagination along rubber and other agricultural lines, and the writer mourns the passing of a warm personal friend and valued correspondent.

In Active Service for Fifty-Four Years

Robert Hague, an old employe of the Hodgman Rubber Co., 25 West 43rd street, New York, N. Y., died at his home in Brooklyn on August 27, 1923, at the age of 88 years. He had rendered faithful service to the Hodgman organization for fifty-four years, after which he was retired from active service on a pension, having the unique distinction of being on the company's payroll for nearly seventy years. His son, Frank Hague, a member of the organization's sales force, has been in their employ for thirty-five years, a record of over one hundred years for father and son.

Mrs. B. G. Work

Mrs. Marion Work, wife of Bertram G. Work, president of The B. F. Goodrich Co., Akron, Ohio, died on August 26 at her home in Oyster Bay, Long Island, after an illness of several months. Mrs. Work was a daughter of Thos. Sawyer, for years superintendent of the Easthampton Rubber Thread Co. She is survived by her husband and one son, Bertram, Jr.

Founder of Underwriters' Laboratories, Inc.

With the death, on September 17, of William Henry Merrill, the institution known as Underwriters' Laboratories has lost its founder and chief executive who had devoted to the cause of fire protection and prevention his entire business career, representing a third of a century.

In 1898, Mr. Merrill organized the work now known the world over as Underwriters' Laboratories and has since served as its president, both the institution and its influence in the building and manufacturing industries being the result mainly of his efforts. He was a principal factor in bringing together the various interests which adopted and sponsored the first edition of the National Electrical Code, and also served in turn as secretary-treasurer and president of the National Fire Protection Association. In 1918 he was drafted for war service, acting as chairman of the Fire Prevention Section, War Industries Board.

Mr. Merrill was a member of the Mid-Day and University Clubs of Chicago and of the Sigma Chi college fraternity. He is survived by his widow, and five children of a former marriage.

A Thirty-Six-Year Rubber Executive

The suspension of operations and the tolling of the bell at the National India Rubber Co.'s plant at Bristol, R. I., in the afternoon of September 20 impressively proclaimed the obsequies of James Wallace Franklin, assistant to Manager Edward I. Cooper, who had been employed by the company for 36 years in various capacities and for 20 years as one of its prominent executives. He entered the employ of the company while in his 'teens and had advanced steadily through various departments. He had been assistant to Manager Cooper since the leaving of George I. Schlosser, as superintendent, having been private secretary to Mr. Schlosser.

Mr. Franklin, for the past few months, had been very despondent because of personal affairs, causing a decided change from his usual jovial disposition. He was 56 years old and for a great many years was active in the politics of Bristol, serving several terms on the Bristol Town Council and in the General Assembly.

News of the American Rubber Trade

Financial

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Brunswick-Balke-Collender Co.....	Pfd.	1¾% q.	Oct. 1	Sept. 20
General Tire & Rubber Co.....	Pfd.	1¾% q.	Oct. 1	Sept. 20
Goodyear Tire & Rubber Co.....Prior Pfd.		$2.00 q.	Oct. 1	Sept. 15
Goodyear Tire Co. of Canada.....	Pfd.	1¾% q.	Oct. 3	Sept. 15
Goodyear Tire Co. of Canada.....Prior Pfd.		1½% q.	Oct. 3	Sept. 15
Hood Rubber Co.....	Com.	$1.00 q.	Sept. 29	Sept. 19
India Tire & Rubber Co.....	Com.	.....	.....	Sept. 20
India Tire & Rubber Co.....	Pfd.	.....	.....	Sept. 20
Kelly-Springfield Tire Co.....	6% Pfd.	$1.50 q.	Oct. 1	Sept. 17

New York Stock Exchange Quotations

September 22, 1923

	High	Low	Last
Ajax Rubber, com.....	5⅞	5¼	5½
Fisk Rubber, com.....	7⅞	7¼	7⅜
Goodrich, B. F., Co., com.....	23½	22⅛	22⅛
Goodrich, B. F., Co., pfd. (7).....	81½	77	78
Goodyear Tire & Rubber, pfd.....	44	36	36
Goodyear Tire & Rubber, prior pfd. (8).....	92½	91	91
Kelly-Springfield Tire, com.....	30	25⅜	27
Keystone Tire & Rubber, com.....	4½	3⅞	3⅞
Lee Rubber & Tire, com. (2).....	18	16⅝	17¼
United States Rubber, com.....	40¼	36½	38¼
United States Rubber, 1st pfd. (8).....	92¾	90¾	92½

Akron Rubber Stock Quotations

Quotations of September 21, supplied by App-Hillman Co., Akron, Ohio, were as follows:

	Last Sale	Bid	Asked
American com.	7¼	...	10
American pfd.	50	...	40
Amazon com.	2	3	...
Firestone com.	62	61	62
Firestone 6% pfd.	93	...	93
Firestone 7% pfd.	86	86½	90
General com.	153	150	155
General pfd.	94⅝	94	98
Goodrich 6½'s	99⅜	99¼	99¾
Goodyear com.	9⅛	9	9¼
Goodyear pfd.	43½	40	43
Goodyear 1st mtg. 8's	116½	116	117
Goodyear deb. 8's	101¾	101½	102
India com.	79	75	79
India 7% pfd.	80	78	85
Mason com.	1⅜	1¼	1⅝
Mason 7% pfd.	15½	15	17
Marathon	2	...	2
Miller com.	66½	65	69
Miller 8% pfd.	97½	97	98
Mohawk com.	6	5	8
Mohawk 7% pfd.	49½	...	38
Rubber Products	20	10	20
Seiberling com.	4	4	5
Seiberling 8% pfd.	50	35	45
Star com.	20	...	25
Star pfd.	80	...	80

New Incorporations

Andrews Armor Tire Co., August 21 (Delaware), $100,000. F. L. and M. E Mettler; P. M. Gilkey, all of Wilmington, Delaware. Delaware agent, F. L. Mettler, 832 Market street, Wilmington, Delaware. To manufacture and distribute tire protectors.

Argos Asbestos & Rubber Co., August 22 (Delaware), $25,000. W. Car-Skaden; L. A. Vezie; J. E. Alick, all of Pittsburgh, Pennsylvania. Delaware agent, Capital Trust Company of Delaware, Dover, Delaware. To manufacture rubber goods, asbestos goods and combinations of rubber gaskets and textiles.

Astor Tire Corporation, September 10 (New York), $1.000. H. Downing, 1985 Crescent avenue, Bronx; D. Beerman, 36 West 44th street, both of New York City; C. M. Downing, 356 Valley street, South Orange, New Jersey. To manufacture tires and tubes.

California Tube & Tire Co., July 30 (California), $1,500,000. C. F. Hunter; E. St. Albans; J. S. White; F. J. Cook; S. Wortley, all of 417 Detwiler Building; M. Dozier, Jr., 419 Detwiler Building; E. W. Mattoon, Hall of Records, all of Los Angeles, California. Principal office, Los Angeles, California. To deal in tires, tubes and other accessories.

Fletchers' Footwear, Inc., August 27 (Massachusetts), $10,000. G. S. Fletcher, president, Marlborough; A. C. McElwain, treasurer, Hudson, both of Massachusetts. Principal office, Marlborough, Massachusetts. To manufacture and deal in boots, shoes, and footwear and all articles and things of every description which may be produced from leather, rubber or other materials.

Gillice Tire & Rubber Co., August 29 (Delaware), $500,000. M. M. Lucey; L. C. Browne; L. S. Dorsey, all of Wilmington, Delaware. Delaware agent, Colonial Charter Company, 927 Market street, Wilmington, Delaware. To acquire letters patent for an armor for pneumatic tires.

Honecker No-Air Tire Corporation, April 26 (Indiana), $10,000. C. V. Honecker; J. C. and H. F. Morin; E. Kuntz; A. Lease, all of Brookville, Indiana. Principal office, Brookville, Indiana. To develop a high-speed resilient solid tire.

International Cushion Wheel Corporation, August 20 (Delaware), $3,000,000. R. R. Armstrong, 602 West 137th street; F. J. Nolan, 502 West 143rd street; C. F. Rideal, 15 West 44th street, all of New York City. Delaware agent, Delaware Registration Trust Company, 100 West 10th street, Wilmington, Delaware. To manufacture and deal in automobile wheels of every class and description.

Jackson-Machlin Rubber Co., September 19 (New York), $50,000. W. J. Jackson; F. and E. O. Machlin, all of 1819 Broadway, New York City. To manufacture tires, tubes, etc.

Jones Tires & Storage Co., Ira, July 15 (Texas), $3,000. I. Jones, president; L. Shell, vice president; R. A. Judd, secretary and treasurer. Principal Office, Beaumont, Texas. To carry on a storage and automobile accessory business.

Leak-Proof Inner Tube Co., August 24 (New Jersey), $250,000. E. M. Skinner, 42 Cleveland Terrace, Bloomfield; L. E. Harding, 107 Halsey street; J. A. Bernhard, 763 Broad street, both of Newark, all of New Jersey. Principal office, 763 Broad street, Newark, New Jersey. To manufacture, import, export, buy, sell, trade and deal in tires and tubes for automobiles and other vehicles, and moulds, machines and apparatus for the manufacture and treatment of such tires and tubes, and particularly leak-proof inner tubes.

Market Motor Supply Corporation, September 10 (New York), $4,000. W. P. and P. Tenzer, both of 235 West 110th street; F. J. Brown, 36 West 44th street, all of New York City. To manufacture tires and tubes.

Mount Kisco Rubber Co., September 4 (New York), $15,000. H., H. B. and L. Potter, all of Mount Kisco, New York. Principal office, Mount Kisco, New York. To conduct a general automobile and garage business.

Myers Rubber Co., Inc., July 20 (Virginia), $10,000 paid in, $25,000 maximum. I. Y. Stern, president; H. H. Guill, secretary and treasurer; E. P. Baker. Principal office, Richmond, Virginia. To manufacture and install rubber and cork tile floors as well as linoleum, cork, matting, mats, rubber bands, hose, etc.

O'Brien's Tire & Battery Station, Inc., September 7 (New York), $5,000. H. A., L. A. and E. C. O'Brien, all of 449 Fifth avenue, Troy, New York. Principal office, Troy, New York. To manufacture storage batteries, tires, etc.

Scientific Manufacturing Corporation, August 20 (Delaware), $100,000. M. M. Lucey; M. B. Resse; L. S. Dorsey, all of Wilmington, Delaware. Delaware agent, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in any article made of wood, rubber, etc.

Tiger Tire & Rubber Corporation, July 23 (Maryland), $1,000,000. H. C. Moore, 177 St. Clemens avenue; H. H. Hastings, 35 High Park Boulevard, both of Toronto, Canada; E. Fetter, 823 North Lakewood avenue, Baltimore, Maryland. Principal office, 749 Equitable Building, Baltimore, Maryland. To manufacture and deal in rubber goods.

The Rubber Trade in the East and South

Manufactured Goods

Rubber manufacturing conditions remain much as they were a month ago, with some improvement noted in many lines after the usual summer seasonal dullness.

Tire production of the larger companies is reported 25 to 35 per cent down from the June schedules. Those of 500 to 1,000 daily capacity are on full schedule. The smaller companies particularly are feeling the effects of low prices for tires.

Conditions in mechanical goods lines have shown distinct change for the better, despite price cutting tendencies. The heel business recently suffered severely by reason of the shoe strikes in New England. That crisis being past, conditions are improving. The vogue of bright colored shoes for women's wear has led to correspondingly bright colored rubber heels to match. Any color is now possible by the use of organic colors and ultra accelerators at low temperature cures.

Insulated wire companies have reduced the volume ordered but business is still in satisfactory condition, with factories operating on full time.

Footwear factories are well occupied on goods for winter wear.

Carriage cloth for automobiles is doing well because of the continued record production of passenger cars.

American Schaeffer & Budenberg Corp.

The merging of the interests of The Schaeffer & Budenberg Manufacturing Co. and the American Steam Gauge & Valve Manufacturing Co., which became effective a year ago, has resulted most satisfactorily in bringing more business to the concern, while the line of goods produced is more complete than before. With improved operating conditions the name of the company has also been changed to The American Schaeffer & Budenberg Corporation, the address of the general offices being Berry and South Fifth streets, Brooklyn, New York. The company's plants are maintained at Boston, Massachusetts, and Brooklyn, New York, where a specialty is made of the manufacture of valves, gages, and various instruments for indicating, regulating and controlling pressures, temperatures and speeds. H. B. Nickerson is vice president.

The I. B. Kleinert Rubber Co.

The I. B. Kleinert Rubber Co., manufacturer of rubber specialties, and which recently established its headquarters at 485 Fifth avenue, New York, N. Y., is an organization with a long and successful history. The founder of the company, Isaac B. Kleinert, came to the United States in 1850, and about the year 1879 became interested in the manufacture of women's dress shields, then a comparatively new industry. In 1890 his business was incorporated under the laws of West Virginia as the I. B. Kleinert Rubber Co., with Mr. Kleinert as president; H. A. Guinzburg, treasurer; and V. Guinzburg, vice president and secretary. Mr. Kleinert died in 1913. His two associates are still connected with the organization, V. Guinzburg as president; H. A. Guinzburg, vice president and treasurer. A. B. Salinger is secretary.

With the steady growth of the business, the company's plant, early established at College Point, Long Island, New York, soon required extensive additions, these being made in the years 1900, 1902, 1912 and 1921. A branch factory is also maintained in Toronto, Canada, as well as two other plants in lower New York City. While the manufacture of dress shields has been continued, the company has during recent years also met with success in making similar products a specialty.

New York

The Malone Rubber Co., Inc., Malone, New York, recently acquired at receivers' sale the buildings and property of the North American Process Co., Inc., and will manufacture molded goods, specializing in automobile tubes, particularly the largest sizes. The new organization, which begins operations with a capital of $100,000, is headed by the following executives: L. F. Lehr, president; William L. Allen, vice president; Allen H. Frost, secretary; and Hiland Estabrook, treasurer.

The Niagara Rubber Manufacturing Co., 246-248 Herman street, Buffalo, New York, manufactures tire flaps, in addition to inside tire plasters, skived patches, and reliners. H. Heimel is manager.

Pennsylvania

John H. Meyer & Co., Inc., manufacturer of tire duck, has recently discontinued operations at Newark, New Jersey, and removed much of its machinery and equipment to its branch plant at Frankfort, Pennsylvania. At the new address excellent manufacturing facilities have been secured, and thoroughly modern provisions have been made for spinning and weaving cord for cord tire fabrics.

Several changes have been recently made in the district office personnel of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, which include the following: A. D. Stewart has been appointed branch manager at Butte, Montana, succeeding R. J. Cobban, who has been transferred to Seattle, Washington. L. C. Lamont has been made office manager at Los Angeles, California, while A. G. Crocker has been appointed manager of the industrial division of the Detroit, Michigan, office. William Ives has been stationed at Norfolk, Virginia, in charge of a subdivision of the branch at Baltimore, Maryland.

The Rubbercraft Corporation, Doylestown, Pennsylvania, will manufacture a complete line of rubber balls, of standard size, as well as a varied line of toys. The sales policy of the corporation includes dealings with jobbers only, the retail trade being reached through these jobbing connections. W. J. McLaughlin is vice president and general manager.

Eastern and Southern Notes

The Alling Rubber Co., 158 State street, New London, Connecticut, has recently awarded a contract for the erection of a store and office building at 234-40 State street, New London, which when completed will represent, including the cost of the land, an investment of approximately $125,000. The Alling organization maintains a chain of thirty-four stores handling automobile tires and sporting goods, these stores being located in the states of New York, New Jersey, Pennsylvania, Massachusetts, Connecticut and Rhode Island. Ward T. Alling is president.

The Marshville Manufacturing Co., Marshville, North Carolina, is to specialize in the production of cord tire fabric only, and new equipment for that purpose has been recently installed at the company's plant. Executives of the Marshville organization include: S. M. Robinson, president; H. B. Marsh, vice president; A. M. Stack, secretary and treasurer.

The Quitman, Georgia, plant of The Western Reserve Cotton Mills Co., a subsidiary of The Mason Tire & Rubber Co., Kent, Ohio, has been put in full operation. It is expected that work will also begin at the Millen, Georgia, plant, probably about December 1.

President of Dunlop Corporation

Since his graduation in 1913 from the Massachusetts Institute of Technology as president of his class, Edward B. Germain has held several positions of great responsibility, his record being a remarkable one for so young a man.

E. B. Germain

He began his business career in 1914, remaining for a year with the Snow Steam Pump Works, later becoming associated with the Aberthaw Construction Co., Boston, Massachusetts. At the outbreak of the war he was advanced to the position of general manager of the Aberthaw organization, leaving that company in 1917 to accept a similar position with the Bethlehem Shipbuilding Corp., Ltd. In this connection he had charge of three Bethlehem plants, at Buffalo, New York; at Providence, Rhode Island; and at Elizabeth, New Jersey.

At the end of the war Mr. Germain was transferred to Wilmington, Delaware, as general manager of the Bethlehem company's Harlan plant, while in 1921 he removed to New York, becoming general sales manager of the Bethlehem organization, with offices at 25 Broadway. In his position as president of the Dunlop Tire & Rubber Corporation of America, Buffalo, New York, Mr. Germain has another opportunity to demonstrate his unusual ability in efficient management and capacity production.

"PNEUMATIC TIRES," BY HENRY C. PEARSON. AN ENCYCLOPEDIA of tire manufacture, repair, rebuilding, machinery and process.

The Rubber Trade in New Jersey

Manufactured Goods

Trenton rubber manufacturers producing staple goods report that business is keeping up very well, although there had been a cut in the production of certain seasonable goods. Some of the factories have been compelled to curtail on the production of tires and tubes and have laid off help. There is no further demand for jar rings, but the plants are now busy on garden hose and cotton fire hose. One concern reports that it is turning out 2,000,000 feet of garden hose for next year's sale. This hose has been sold and will be held in the warehouse for shipment after the new year. The demand for packing and belting continues good.

Trenton Notes

Trenton rubber manufacturers and individual officials responded liberally to the fund being raised for the stricken Japanese. George R. Cook, president of the Acme Rubber Manufacturing Co, and head of the Hamilton Rubber Manufacturing Co., gave $350. Robert J. Stokes, secretary of the Thermoid Rubber Co., contributed $250 for his concern. Thomas H. Thropp, president of the Trent Rubber Co., sent a check for $100, while A. Boyd Cornell, secretary of the Hamilton Rubber Manufacturing Co., also donated a good sized check. The Joseph Stokes Rubber Co. gave $250.

An interesting paper on "Rubber" was read before the Rotary Club at Trenton by John Edward Myers, superintendent of the Acme Rubber Manufacturing Co. He outlined the history of crude rubber, when and how it was discovered, and compared South American and plantation rubber.

The Empire Rubber Corporation is operating with two shifts in the garden, cotton hose, and rubber bands departments. Hose orders for next year are now being filled. The belting department is also operating to capacity, while there has been no cut in the production of tires.

During the first month's operation of the Bergougnan Rubber Co., under the receivership there has been profit and a substantial gain in production. After the concern has been operated three months by the receivers and matters are settled up, there will be a reorganization meeting.

Whitehead Brothers Rubber Co. has let a contract for a new boiler house which will be one story and 55 by 60 feet and contain three 100-horsepower boilers. The old boiler house will be remodeled for other use. The new boiler building will cost $10,000. The Whitehead Brothers Co. is the oldest rubber mill in this section, having been established 55 years ago.

The Murray Rubber Co., Trenton, is specializing in the production of mechanical rubber goods, the plant output including transmission, elevator and conveyor beltings; all types of molded and suction hose; and dredging sleeves. The Murray organization, incorporated in November, 1922, with a capital of $2,000,000, took over the plant and business of the former Empire Tire & Rubber Corporation.

The Hamilton Rubber Manufacturing Co. is erecting a two-story addition for the belting department. Modern machinery is being installed. The company continues busy in some departments.

The Spartan Rubber Co. continues to operate twenty-four-hours a day with three shifts of tire makers. E. D. Newman, secretary of the concern, says his company is selling all the tires that are being turned out.

Roseman Brothers, located in the Stacy-Trent garage, Trenton, have been appointed agents for Raybestos brake lining and clutch facings. The concern is conducted by Samuel and Julius Roseman, who have been identified in the auto and rubber business for the past twelve years.

The Central Tire Co., Trenton, has been given a contract to supply tires for the five big buses being used by the Central Transportation Co. Seven tires are furnished each bus.

The city commission of Trenton has let a contract to the Empire Rubber Corporation for several thousand feet of fire hose.

New Jersey Notes

The plant of the Stanwood Rubber Co., Elizabeth, was sold September 8 at public sale to the Union Trust Co. and the Hudson County National Bank of Jersey City for $240,000. There were no other bidders. The plant was acquired by the two Jersey City institutions in order to protect a mortgage of $300,000 with an additional $30,000 in back interest, held on the buildings and equipment. The sale carries with it all the machinery and office fixtures. The plant is modern and equipped for the manufacture of tires and other rubber goods.

The H. and M. Tire Co., New Brunswick, incorporated with $25,000 capital, will manufacture, buy and sell solid rubber tires. Gottfried Henning, of 320 Commercial avenue, New Brunswick, Helen C. Barnwell, of 21 South Fourth avenue, Highland Park, and Rudolph A. Mueller, of 312 Harrison avenue, Highland Park, are the incorporators. The place of business of the concern is at 320 Commercial avenue, New Brunswick.

The United Rubber Machinery Exchange, Newark, has been incorporated at Trenton to deal in rubber machinery and metals of all kinds. The incorporators are Sigmund Liebstein, Annie Liebstein, and Milton J. Liebstein, all of Newark. The company has an office at 49 Marshall street, Newark, with Sigmund Liebstein in charge.

The Rubber Trade in Rhode Island

The publication of two tax lists during the past month has been of more than usual interest to business concerns in this State. The first was the corporate excess and franchise taxes on manufacturing, mercantile and miscellaneous corporations imposed each year by the State Tax Commissioners, and the second was the annual direct property tax assessed by the City of Providence.

The corporate excess, upon which a tax of $4 per $1,000 is levied by the State Tax Board, represents the difference between the total valuation of the corporation's property holdings in Rhode Island, and the assessed value by the city or town in which such property is located, less any exemption of any non-taxable property in this State. Included in the State corporate excess list are the following corporations affiliated with the State's rubber manufacturing industry that pay a tax on a corporate excess of $100,000 or more, together with the amount of the excess and the amount of the tax levied:

American Multiple Fabric Co., 139,741.07, tax $558.96; American Emery Wheel Works, $326,370.25, tax $1,305.48; Anchor Webbing Co., $165,619.83, tax $662.47; Arbeka Webbing Co., $114,737.16, tax $458.94; Atlantic Tubing Co., $114,254.07, tax $457.01; Bourn Rubber Co., $227,975.28, tax $911.90; Brown & Sharpe Manufacturing Co., $4,716,065.81, tax $18,864.26; Collyer Insulated Wire Co., $629,203.10, tax $2,516.81; Davol Rubber Co., $385,755.94, tax $1,543.02; Direct Rubber Co., $131,562.36, tax $526.24; Everlastik, Inc., $205,968.26, tax $823.87; Fisk Rubber Co., $1,030,013.00, tax $4,120.05; Glendale Elastic Fabrics Co., $157,509.80, tax $630.08; George Grow Tire Co., $138,805.17, tax $554.03; Hamilton Web Co., $166,996.45, tax $667.98; Hill & LaCross Co., $109,894.32, tax $439.57; Hope Webbing Co., Inc., $1,311,050.40, tax $5,244.20; Jenckes Spinning Co., $5,195,738.00, tax $20,782.95; Mechanical Fabric Co., $518,984.21, tax $2,075.93; Moore Fabric Co., $180,220.10, tax $720.88; National India Rubber Co., $723,961.82, tax $2,895.84; O'Bannon Co., $246,811.93, tax $987.24; Phillips Wire Co., $1,879,610.08, tax $7,518.44; Tubular Woven Fabric Co., $200,658.62, tax $802.63; United States Rubber Co., $2,546,115.20, tax

$10,184.46; Walker Webbing Co. (R. I.), $508,131.66, tax $2,032.52; Washburn Wire Co., $984,240.71, tax $3,936.96.

The individuals, firms, and corporations of Providence that are taxed on a property valuation of $100,000 or more include the following associated with the rubber industry: American Emery Wheel Works, $351,880; American Multiple Fabric Co., $117,580; estate Joseph Banigan, $1,110,480; Augustus O. Bourn, $95,140; Bourn Rubber Co., $309,200; Central Automobile Tire Co., $226,480; Davol Rubber Co., $687,100; Mary E. Davol, $880,400; Glendale Elastic Fabrics Co., $217,100; Holbrook Rawhide Co., $97,100; International Braid Co., $1,217,460; Mechanical Fabric Co., $129,500; Eugene R. Phillips, $155,600; Providence Rubber Co., $56,700; Rhode Island Hospital Trust Co., trustee of estate of Joseph Davol, $391,600; United States Rubber Co., $4,567,440; Industrial Trust Co., trustee under will of Samuel P. Colt, $109,880.

Final steps in the $39,000,000 merger of the Jenckes Spinning Co. and the Manville Co., which was outlined in this column last month, have been taken at special meetings of the stockholders of both corporations. Following these meetings incorporation papers were filed at the Secretary of State's office in accordance with the laws of Rhode Island, amending the charters of the two corporations and merging them into one corporation to be known as the Manville-Jenckes Co., with a capitalization of $39,000,000. As soon as the papers were filed the new corporation proceeded to organize by the election of officers. Former United States Senator Henry F. Lippitt, who had been general manager of the Manville Co., was elected president of the new corporation, with Frederick L. Jenckes, treasurer of the Jenckes Spinning Co., as treasurer. Isaac B. Merriman, who was president of the Manville Co., will be general manager, and Charles H. Merriman, Jr., a director of the Manville Co., will be vice president.

Extensive changes and improvements are under way at the plant of the Mechanical Fabric Co., 40 Sprague street, Providence, which will completely revolutionize the motor power employed in the operation of the concern. At present steam power is generally used, furnished by a battery of boilers, but these are being gradually replaced by powerful dynamos of great capacity, it being the intention to eventually use electricity throughout the works. The company has been enjoying a period of activity that has seldom been excelled by it, and its exportation business has been largely on the increase. Considerable business has been developed in Japan, which has been temporarily affected by the serious disaster that recently devastated that country.

Seventy representatives of the management and employes of the Davol Rubber Co. gave a dinner at the Hotel Dreyfus, Providence, on the evening of September 19, in honor of Mrs. Florence P. Blake, forelady of the "special-making room," who is retiring from the service of the company after 39 years of continuous employment. During the evening Mrs. Blake was presented a purse of gold by the employes, a substantial check from the company and a bouquet of roses. General Manager P. R. Wesley was toastmaster and among those who responded were Vice President C. B. Bamford and Superintendent of Plant Jesse K. Little.

The factory of the National India Rubber Co. at Bristol shut down August 31 in accordance with the announcement made earlier in the month, because of lack of orders. The shoe division reopened September 5 and the wire division on September 17. In normal times 3,500 are employed in the shoe division and 400 in the wire department. Repairs to the machinery were made during the shutdown.

The O'Bannon Co.'s plant at West Barrington closed down August 25 for a week's vacation period, during which there was a general overhauling of machinery and an inventory of the stock.

The Lawrence Felting Co. at Millville has resumed its regular eight-hour schedule, with good orders on hand.

The Dunlop Tire & Rubber Co., Buffalo, New York, is now supplying Pawtucket and vicinity with Dunlop cord tires, through the agency of Elliott's Tire Shop, 122 High street, that city.

The Columbia Narrow Fabric Co. of Shannock has increased its facilities by the recent purchase of the Rocky Brook Mill, which will be used entirely in the manufacture of elastic webbing.

The Rubber Trade in Massachusetts

Manufactured Goods

The opening of the autumn season finds the rubber business, like manufacturing generally, very uneven. While there is more activity than during the summer, gains are slow and competitive prices conspicuous. Rubber shoe manufacturers are busy with orders for autumn delivery, while heel and sole production is resuming normal owing to increasing shoe manufacturing activities. Tire output, although considerably below peak, is perhaps less adversely affected here than in the larger tire centers, as most Massachusetts manufacturers are engaged in a replacement rather than an original equipment business. The appearance of 1924 automobile models is expected to stimulate the demand for automobile topping, which has fallen off in recent months, as is the probable approach of autumn rains to increase the sale of waterproof following an exceptionally dry summer. Mechanical goods business is somewhat better in certain lines and quiet in others, while insulated wire output is being well maintained. The hard rubber trade continues satisfactory.

Phillips Rubber Co. Becomes a Sales Organization

The Phillips Rubber Co., a Massachusetts voluntary trust, has recently been changed to a Massachusetts corporation under the name of the Phillips Rubber Co., Inc. Oliver Perry Hussey is treasurer and general manager.

The Sanford Rubber Works, Inc., a Connecticut corporation, has recently acquired the plant and equipment of the Phillips Rubber Co., Inc., at 38-45 Main street, Cambridgeport, where a general molded rubber business will be conducted.

The Phillips Rubber Co., Inc., will continue at 10 High street, Boston, as a sales organization exclusively, handling goods made under its various brands at the Sanford works. The Sanford Rubber Works, Inc., also has its Boston office at 10 High street.

Massachusetts

The Meade Rubber Co., of Stoughton, is placing on the market a rubber holder for the spool, tube or cone of cotton or silk thread used by shoe, clothing and fabric manufacturers. It is an invention of Matthew Meade, on which he has a patent pending, and is the result of his experience in the stitching departments of various shoe factories. He claims that it will effect a considerable saving of material, time and patience.

Two additions are being made to the plant of the Panther Rubber Manufacturing Co., of Stoughton, in order to facilitate the handling of increased production. This firm specializes in several brands of rubber heels, rubber and fiber soles, mats and matting, and certain lines of mechanical molded rubber goods.

Miah Marcus, of Boston, has petitioned the Supreme Court for a writ of mandamus to compel Frank Berenstein, of Chelsea, to allow him to see the corporate books of the Panco Rubber Co., of Chelsea, and of the Panther Rubber Manufacturing Co., of Stoughton. He recites that he owns one-third of the stock and is a director of both corporations and vice president and secretary of the Panther company; that the respondent is president and a director of both corporations; and that both of them constitute the entire board of directors of both corporations, the third director having deceased. Marcus alleges that Berenstein runs each company as though it were his own property and denies the petitioner the right to function as a director in either company.

The Quabaug Rubber Co., of North Brookfield, manufacturers of "Armortred" rubber heels and other mechanical rubber goods, reports a satisfactory business now feeling the improving

condition of the footwear trade. This firm has built up a steady original equipment heel business on the firm foundation of quality merchandise and service to patrons. Herbert T. Mason is president and treasurer of the company and its controlling stockholder.

The New England Tire & Rubber Co., of Holyoke, is among the concerns in this district which are energetically advocating the use of New England made tires by New England motorists. An extensive sales campaign is being conducted in New England newspapers.

The Firestone-Apsley Rubber Co., of Hudson, announces the appointment of J. W. Jessop as purchasing agent. Mr. Jessop has been in their employ for the past ten years and his appointment comes as a well-merited promotion.

Boston

Edwin P. Brown, president of the United Shoe Machinery Co., and a party of relatives and friends, including J. H. Connor, vice president and manager of the foreign department, are reported safe in Japan following the earthquake. Owing to a change in their original plans they were in the mountains at Nikko, one hundred miles away, instead of in Tokio on September 2, the day of the disaster.

Winthrop Brown, Jr., of Cambridge, has resigned as vice president and assistant treasurer of the Davidson Rubber Co., manufacturer of druggists' and surgical sundries and hard rubber goods.

Among the recent retail tire sales companies organized in Boston are the Canal Tire & Rubber Co., 97 Canal street, and the Long Wear Rubber Co. of New England, 304A Columbus avenue.

The movement, started in Washington, D. C., to gather old rubber and tinfoil to swell the welfare fund of the American Legion has spread to Boston and is making good headway. At present prices, however, a gigantic accumulation of scrap rubber must be made if this branch of the campaign is to net a substantial sum.

The International Textile Exposition, under the auspices of the Textile Exhibitors' Association, Inc., and in conjunction with the semi-annual meeting of the National Association of Cotton Manufacturers, is to be held in Mechanics Building, Boston, from October 29 to November 3, under the personal direction of Chester I. Campbell. As in the past, it will comprise the greatest display of cotton, woolen and silk weaving and knitting machinery and allied industries of the year. Much of interest is promised to all users of textiles in the rubber industry.

The Salmon Falls Manufacturing Co., Inc., 50 State street, has recently reported total sales for the fiscal year ended June 30 amounting to $2,639,568. The company specializes in the production of carded and combed tire fabrics.

A receiver to take charge of the affairs of the Harrington Shoe and Tire Co. has been asked for in a petition filed in the Suffolk Superior Court by Clarence M. Johnson, a shareholder. This company is a $10,000,000 trust with an office in Boston and a factory in Malden, the purpose being to manufacture and sell Harrington tire soles, covers and other Harrington patented products. The respondent trustees are Albert H. Harrington, Frank C. Harrington, Frank R. Conant and William T. Soulee, all of Malden, and Roscoe A. Pickens, of Watertown. It is alleged that to date nothing but samples have been made by the factory and that the trust fund is being dissipated for the benefit of the trustees. Albert H. Harrington is said to be president, treasurer and sole manager and director of the trust.

UNITED STATES EXPORTS DURING THE FIRST SIX MONTHS OF 1922 of automobile tires were valued at $8,787,184. The figures for the corresponding six months of 1923 are estimated at approximately $11,948,000.

President of the Republic Rubber Co.

Edward Hubbard Fitch, recently elected president of the Republic Rubber Co., Youngstown, Ohio, is a native of that state, where he was born in the city of Ashtabula, in 1873. He was educated in the public schools of Jefferson, Ohio, Western Reserve Academy, Oberlin College, and Cornell University, from which latter he was graduated in 1897. The following year he began his business experience with the Standard Oil Co., and for seven years he was district manager for that firm, with headquarters at Akron, Ohio.

E. H. Fitch

In 1905 he first became identified with the rubber trade as district manager of the Philadelphia, Pennsylvania, division of the Diamond Rubber Co., Akron, Ohio, which position he held for fourteen years. When the Philadelphia offices of this concern were consolidated with those of the B. F. Goodrich Co., he was placed in charge with supervision of Diamond sales through the south to Texas. In 1919 he was transferred to Akron as director of Goodrich tire and mechanical rubber goods sales to automobile and truck manufacturers, and the following year was also given Diamond sales of tires and mechanicals for the whole country.

Near the close of 1921, at the solicitation of C. H. Booth, then receiver of the Republic Rubber Co., Mr. Fitch left the Goodrich organization to accept the position of general manager of the Republic company. Under his energetic and constructive direction the concern has shown marked progress. Having played varsity tackle at Cornell he has been imbued with the value of team work, and his sales policies have been such as to help dealers to solve their problems. With the approval of the board of directors he contemplates no important changes in organization, it being his desire that the company remain an independent integrated concern retaining its character as a community organization.

Mr. Fitch's hobbies include many forms of athletics and the breeding of blooded stock. He has a farm at Hudson, Ohio, noted for its splendid horses and cattle. His college fraternity is Delta Kappa Epsilon and he is a member of the Union League Club of Philadelphia.

The Rubber Trade in Ohio

Akron Companies Reduce Tire Prices

Announcements of further drastic cuts in the price of tires by the larger Akron rubber companies was the outstanding development this month. It is reported that smaller companies follow in the downward revision of prices. The Firestone Tire & Rubber Co. was the first to announce a reduction of 12 to 14 per cent on smaller size tires. The Goodrich Tire & Rubber Co. followed with a reduction of 12 to 18 per cent. Although official announcement has not been made, the Goodyear, Miller and other factories are understood to be preparing lower price lists to dealers. The Mason Tire & Rubber Co. is offering tires to dealers

at lower prices as a special inducement for cash. As a result, there has been a large increase in orders, which is keeping the plant running at capacity.

Although there have been some signs of a business revival, the expected increase of production this fall in the tire industry is developing slower than was predicted. Officials, however, have hopes of better business in the latter part of the year.

H. S. Firestone Optimistic

In the opinion of Harvey S. Firestone, president of the Firestone Tire & Rubber Co., production of rubber will soon be on the increase, despite recent pessimistic rumors. He expressed himself as optimistic concerning the general rubber situation even in its present unsettled state. Although there have been drastic reductions in tire prices, in which his company has been in the lead, he pointed out that crude rubber prices are also exceedingly low, and may go lower. Orders from dealers and manufacturers for spring delivery will soon enable the factories to bring their production to near capacity, Mr. Firestone said.

When asked about the new rubber association which was largely the result of his efforts after he resigned from the Rubber Association of America, Mr. Firestone said the new organization was at present "marking time."

"The association is not doing anything at present. I have been away most of the time this summer, and really have not given as much time to it as I should. We are just letting matters take their own course, and are in hope the situation will better itself in the near future."

Mr. Firestone scored the plan of the British Government to place an import tax on American auto tires. This is another argument in favor of American-owned rubber plantations, in his opinion. On account of the English restrictive act, rubber is still costing 100 per cent more than before the legislation was enacted, Mr. Firestone declared.

Amazon Plant Busy

The Amazon Tire & Rubber Co. is one of the few rubber factories in the Akron district which has recently reported a large increase in tire production. Announcement was made by Superintendent F. C. Sowers that production of tires at the plant has just been doubled. A second shift was put on September 20 in order to take care of the heavy orders received. In a short time Mr. Sowers said he expected a third shift would be placed in operation. More men are being employed every day. Placing of the new reconstructed Amazon heavy duty cord tire on the market is responsible for the large increase in sales, according to Mr. Sowers. Officials of the company are especially pleased with the response of the trade to advertising of the new tire.

Goodyear Activities

A monster crowd attended the celebration of the twenty-fifth anniversary of the Goodyear Tire & Rubber Co. at Seiberling Field on Labor Day. Company officials attended a dinner, at which George Swartz and Ed Hippensteal, 25-year employes were presented with gold pins.

The 55,555,555th tire made by the Goodyear Company is now being displayed in the Goodyear store window. It is said to be the largest tire manufactured, and is 54 by 12. When the tire was made a short time ago, factory whistles were blown, celebrating the event.

A new department has been established at the Goodyear factory, which is designated as the machine and maintenance department. Webb Lail is in charge.

National Standard to Begin Operations

Operations are expected to be started in the near future at the new branch of the National Standard Co., of Niles, Michigan, which was purchased early this month from the B. & W. Rubber Co. at Barberton. A building and a five-acre lot were included in the deal.

The company will erect additional buildings as business grows, according to W. H. Parkin, secretary and treasurer. The concern is one of the largest manufacturers in the country of tire bead cable, auto jacks, truck jacks, and air compressors.

Akron

The ZR-1, the United States Navy's 700-foot dirigible, which recently accomplished a successful flight over New York City and neighboring towns of three states, represents in some of its construction the work of the Goodyear Tire & Rubber Co., Akron, Ohio. The rubberized air cells of the ZR-1 were built and lined with goldbeater's skin by Goodyear on a contract begun early in 1921 and completed almost a year ago. The cells are 36 in number, eighteen being used and eighteen spares held in reserve.

An excellent outlook for the future is reported by The Miller Rubber Co., Akron, Ohio, manufacturer of tires, tubes, druggists' rubber sundries, bathing caps, belts, shoes, balls, dolls, toys, composition mallets, etc. According to present indications, based on recent sales, production schedules, and factory capacity, there will be an output during 1923 of approximately 191,000,000 pieces of merchandise.

H. B. Hankinson, formerly assistant sales manager of the India Tire & Rubber Co., has recently accepted a similar position with The Mohawk Rubber Co., Akron, Ohio.

Robert J. Bonstein, formerly chemist with the Kelly-Springfield Tire Co., is now chief chemist for the Swinehart Tire & Rubber Co., Akron, Ohio. Robert Williams is superintendent.

Plans are being made to remodel the building formerly used by the O. C. Barber Products Co., Barberton, Ohio, as an addition to the plant of the Seiberling Tire & Rubber Co. It was purchased recently by F. A. Seiberling, president of the Seiberling Tire & Rubber Co. Activities at the New Castle plant of the company will be curtailed in order to centralize production at the Barberton plant.

Press reports state that The B. F. Goodrich Co., Akron, Ohio, has recently acquired complete control of the Brunswick tire through the purchase of the entire issue of $100,000 common stock and patent rights of the Brunswick Tire Co., a newly organized subsidiary of the Brunswick-Balke-Collender Co., Chicago, Illinois. Although retaining their executive positions with the last-mentioned organization, B. E. Bensinger and H. F. Davenport have resigned as president and vice president, respectively, of the Brunswick Tire Co. With the transfer of stock the Brunswick-Balke-Collender Co. left the tire manufacturing field, and will devote its attention to enlarging its other business departments.

The contemplated merger of The Mohawk Rubber Co. and The Star Rubber Co., Inc., has finally been considered impracticable, the directors of both organizations believing that their best interests would not be served by such a consolidation. Both companies specialize in the manufacture of pneumatic tires and inner tubes.

Ohio

The Falls Rubber Co., Cuyahoga Falls, Ohio, maker of "Falls" tires and "Evergreen" tubes, is one of the oldest rubber manufacturing organizations in the Akron district, having been producing its special variety of tire for over 14 years. Recently the increase in the company's mechanical goods business has warranted the establishing of a separate department for hard and soft molded articles, tubing, channel rubber, mats, bumpers, and battery jars and covers. H. B. Denman is in charge of the new division.

The Commercial Engineering Co., 316 Bird Building, Mansfield, Ohio, reports satisfactory business conditions, being engaged in designing pneumatic tire equipment for various new companies. The concern specializes in tire and mold equipment, and in the layout and design of rubber factories. At present a reorganization of the company is being considered. A. C. Schroeder is chief engineer.

The concern formerly known as The Cleveland Mixer & Manufacturing Co., specializing in the production of non-sticking, blue processed liners used in tire manufacture, has recently announced a change of name, and will hereafter do business as The Cleveland Liner & Manufacturing Co., 5508 Maurice avenue, Cleveland, Ohio. The corporate name and trade name of the liners are the only changes that have been made, the management and personnel remaining the same as formerly. F. A. Pope is president.

Ellery A. Baker has been appointed treasurer of The Dayton Rubber Manufacturing Co., Dayton, Ohio, following the retirement of R. F. Brown. Mr. Baker was for a number of years assistant vice president of the National City Bank of New York City, also heading the Industrial Service Department of that institution.

Henry Farrington, who has been identified in various capacities with the automotive industry since 1899, has been recently appointed advertising manager of The Mason Tire & Rubber Co., Kent, Ohio. Mr. Farrington was formerly editor of "The Power Wagon," and was for several years publisher and editor of "Agrimotor."

Under the name of the Castle Rubber Co., East Palestine, Ohio, R. J. Turner, as president has, with other associates, formed a partnership for the manufacture of swabs and packer rubbers for the drilling industry. While the new organization will manufacture mechanical rubber goods, they will make the production of oil field rubber a specialty.

At the recent annual stockholders' meeting of The Wildman Tire & Rubber Co., Port Clinton, Ohio, the number of directors of the organization was reduced from seven to five. The officers include: W. W. Wildman, president; G. J. Daum, vice president; W. A. Twynham, treasurer; H. L. Hankammer, secretary.

The directors are: J. F. Langenau, H. P. Orr, G. J. Daum, W. A. Twynham, W. W. Wildman.

The Aetna Rubber Co., 811-815 East 79th street, Cleveland, Ohio, is in the midst of an expansion program which will increase the plant floor space by approximately 20,000 square feet. Increased production along certain lines, particularly in the dipped glove department, warranted the present addition. The Aetna company is one of the largest manufacturers of electricians' and acid workers' gloves, its products being used in the safety departments of leading public utility companies. S. T. Campbell is general manager.

The Columbia Tire & Rubber Co., Mansfield, Ohio, reports that both its Mansfield and Columbiana, Ohio, plants are running at full capacity, the daily production at the former plant being 600 cord tires and 3,200 tubes, and at the latter the production is 1,100 fabric tires a day. The Columbia Tire & Rubber Co. is the parent company of the Para Belle Tire & Rubber Co., as well as the Manhattan Tire & Rubber Co., all of Mansfield. Some changes have been recently made in the executive personnel of the organization, the present officers being: W. B. Martin, president; E. S. Nail, vice president; and S. D. Isaly, secretary and treasurer.

Charles A. Sarchet has been recently appointed receiver for The Vul-Tex Co., Barberton, Ohio, a concern which has been manufacturing leather substitutes, rubber heels, fiber soles, and mechanical rubber goods. The Vul-Tex affairs are to be liquidated through a receivership.

The Lima Cord Sole & Heel Co., Lima, Ohio, manufacturer of "Gro-Cord" shoe soles, rubber heels and specialties, has recently acquired a new plant, which will more than double the factory's former capacity. New equipment has also been purchased, and plant executives are finding it necessary to continue running some departments on a night shift. Officials of the Lima organization include: J. E. Grosjean, president; F. L. Maire, vice president; R. J. Plate, second vice president; J. C. Butcher, secretary; and F. W. Cook, treasurer.

The Osborn Engineering Co., which specializes in the construction of plants for rubber manufacturing companies, has recently removed its offices from 2848 Prospect avenue to 7016 Euclid avenue, Cleveland, Ohio. Executives of the Osborn organization believe that the rubber industry is reviving, for they are busy planning extensions to the factories of certain important rubber companies, with the prospect of other work later.

The Mason Tire & Rubber Co., Kent, Ohio, has been gradually increasing its production during the last few weeks, and is now operating at about 85 per cent of full capacity. The textile division, also located at Kent, will begin work in the near future, while the plant at Bedford, Ohio, will also soon begin operations.

Harry S. Mooradian, superintendent of the Dayton Rubber Manufacturing Co., Dayton, Ohio, has been selected by the government as an expert on tire manufacturing, especially airplane tires and inner tubes and wheels. During the war Mr. Mooradian served as an officer in the air service, and his name has now been placed on file as that of a specialist available in case of national emergency.

Production at the plant of The Eclat Rubber Co., Cuyahoga Falls, Ohio, consists of tube machine output such as fabricless radiator hose, tubings of all sorts, cab tires, channel rubber, etc., as well as inner tubes.

The Rubber Trade in the Midwest

Midwest Rubber Manufacturers Association

There was a good attendance at the September meeting of the Midwest Rubber Manufacturers Association, which was held September 11 at the Hotel La Salle, Chicago, Illinois, Thomas Follen, president of the organization, presiding.

At the meeting of the board of directors it was voted to entirely eliminate any further discussion regarding affiliation with any other organization, this having reference to the proposed merging of the organization's interests with those of the Rubber Association of America.

Following the luncheon certain questions of importance to the industry were considered, among them the matter of price cutting by the larger manufacturers. Causes of overproduction were discussed, and also the need for standardization of styles.

Buffalo F. & M. Co. Extends Engineering Service

The Buffalo Foundry & Machine Co., Buffalo, New York, builder of Buflovak and Buflokast vacuum drying and chemical apparatus, has recently taken over the interests of the Cannon-Swenson Co., Chicago, Illinois, a firm of consulting and contracting engineers. The new offices, at 1636 Monadnock Block, will be in charge of Martin J. Kermer, formerly the chief engineer and general manager of the Cannon-Swenson organization. It is believed that the maintenance of this Chicago branch will afford a closer cooperation with customers located in this section, and place at their disposal the engineering service of The Buffalo Foundry & Machine Co.

Midwest Notes

L. E. Wemple, formerly vice president of the Evans Lead Co., has been recently elected vice president and general manager of the Illinois Zinc Co., Peru, Illinois, one of the largest manufacturers of sheet zinc products in the country. Executives of the Illinois organization are considering the still further development of the business, with a view to manufacturing other products correlated to zinc smelting and rolling.

Executives of the International Rubber Company of America, Anderson, Indiana, announce the appointment of Oscar Knai as factory manager, following the resignation of H. W. Lantz. As the result of a fire which recently destroyed a part of the plant, the manufacture of automobile tubes had been temporarily discontinued. The fire did not affect other departments, or interfere with the production of tires.

The Chicago Rubber Clothing Co., Racine, Wisconsin, manufactures an extensive line of rubber surface clothing and allied specialties; a line of gabardine, whipcord and woolen fabrics, chemically treated; raincoats, rubber blankets and sheetings; inner tubes; heavy aprons for the industrial trades, and household aprons. A specialty is also made of rubberizing and proofing for the trade. Executives of the organization include Walter C. Palmer, president; Edgar L. Haynes, vice president; Martin M. Hueffner, treasurer; and William T. Harvey, secretary and general manager.

The Hawkeye Tire & Rubber Co., Des Moines, Iowa, manufacturer of "Hawkeye" tires, is at present remodeling its factory and installing the necessary equipment for the manufacture of cord tires. Operations will begin October 1 with an output of about 125 tires a day, the plant capacity being approximately 500 tires a day. John T. Christie is president.

H. W. Lantz, formerly factory manager of the International Rubber Company of America, Anderson, Indiana, and the Intercontinental Tire & Rubber Co., Indianapolis, Indiana, has recently accepted a similar position with the Bartling Sales Agency, Inc. This latter organization is the sole factory sales agent for the Lion Tire & Rubber Corporation, Lafayette, Indiana.

When first organized in 1868, the company now known as the Mishawaka Rubber & Woolen Manufacturing Co., Mishawaka, Indiana, was designated the Mishawaka Woolen Manufacturing Co., as this term was indicative of the concern's line of business. However, with the manufacture in later years of rubber footwear, the production of woolen goods became a less conspicuous factor, while the rubber department increased in importance. Through the recent change of the company's name the business has been in no way affected, and all contracts, orders, indebtedness, etc., will be taken care of as though no such change had been made. The products include rubber "Ball-Brand" woolen footwear. Executives of the Mishawaka organization include: E. A. Saunders, president; F. G. Eberhart, vice president and secretary; F. C. Grimes, treasurer; E. J. W. Fink, general manager and manager of sales.

The Rubber Trade on the Pacific Coast

Mexican Trade Possibilities

Rubber manufacturers on the Pacific Coast, especially in the Southwest, are much interested in the recognition of Mexico by the United States and are counting upon considerable business in the southern republic. Several of the larger concerns have sent representatives to Mexico and the reports received point to an early and considerable expansion in trade. Thus far the prospects appear to favor the makers of oil and mining supplies and general mechanicals even more than tires. It is believed that the heavy import tax on tires levied by Mexico to protect a few small makers will be soon again lowered so as to favor American trade.

Pacific Coast Notes

C. W. Case, traffic manager of the Goodyear Tire & Rubber Co. of California, states that the plant in Los Angeles shipped during August the largest quantity of tires ever sent out in a single month, and during that month the company utilized 278 freight cars. Goods sent out of the city filled 148 cars and enough was shipped by truck to fill 27 freight cars. The plant has been very busy of late, production being kept well up to the standard set in August when the plant turned out 125,000 casings, or an average of 5,000 for each working day.

The California Tube & Tire Co. has been organized with $1,500,000 capital, and plans to build an $800,000 factory in Los Angeles having a capacity of about 500 tubes and 500 tires daily. The directors are: Melville Dozier, Jr., Cal. F. Hunter, president of the Hunter Truck Co., Edward St. Albans, manager of the Texas Holding Co., J. St. Paul White, F. J. Cook, S. S. Wortley, vice president of the Chillicothe Tire & Rubber Co., and E. W. Mattoon.

The Samson Tire & Rubber Co., Compton, near Los Angeles, has just closed two large contracts for supplying tires for motor stage lines in California. The Samson concern is exceptionally busy. It is said to be the only concern that manufactures super-oversize cord tires.

W. O. Rutherford, vice president of the B. F. Goodrich Rubber Co., Akron, Ohio, and also president of The Rubber Association of America, recently made an extended tour on the Pacific Coast, making his last call at Los Angeles, where he spent much time with Branch Manager V. G. Martin. Mr. Rutherford, who is director of sales, expressed much surprise at the growth of the Southwest metropolis, and complimented the manager and staff of the branch on having gone 20 per cent over the expected quota for the first half of 1923. Sales are good in all the lines handled by the company.

Another inner tube manufacturing concern expects to be in operation soon in Los Angeles. It is the Ever-Wear Tube & Rubber Co., with a capital of $500,000. The incorporators are L. A. Denker, J. C. Wise, and J. Gritendorf.

Recent visitors to Los Angeles were R. L. Rice and W. E. Payson of the Hood Rubber Products Co., Watertown, Massachusetts.

The American Rubber Manufacturing Co., San Francisco and Oakland, of which N. S. Dodge is president, has been turning out an unusually large amount of hose, varying from garden size to the largest oil suction and delivery hose. The company recently made a considerable extension to its hose plant. Business is reported good in heavy mechanical rubber goods, and the press of orders has necessitated considerable overtime work.

An effort is being made to straighten out the affairs of the Coast Tire & Rubber Co., which recently had an airing in court. The company had booked a large amount of orders, and the directors, Holmes Ives, J. I. Pankratz, A. W. Shepard and N. J. Whelan, declare that the company can be made to operate profitably and pay all debts in ninety days.

Headed by Branch Manager B. W. Sandford, the entire staff of the Portland branch of the Goodyear Tire & Rubber Co. of California will in October make a trip to Los Angeles, where they will be guests for two days of Vice President and General Manager A. F. Osterloh of the Goodyear Co. Mr. Osterloh on behalf of the company had offered a silver cup and the Los Angeles trip as a joint prize to be competed for by the main branches in the eleven western states served by the company. Portland won with the largest percentage of increase in sales for the month of August, although all broke their previous high records.

The Columbia Tire Corporation, which recently started a new tire factory at Kenton near Portland, reports a 300 per cent increase in its output of casings as compared with its initial production. Over 100 workers are employed.

S. L. Schwartz, president of the L. H. Butcher Co., Inc., 239 Front street, New York, N. Y., left San Francisco on September 15 with the intention of visiting the company's Portland and Seattle branches, and calling on the trade en route.

Canadian Notes

The plant at Brampton, Canada, formerly owned and operated as the Hercules Rubber Co., has been recently purchased by The Brampton Tire & Rubber Co., Limited. For the past two years the factory has been steadily carried on with a night and day schedule, and it is planned under the new organization to continue this procedure. E. M. Cockin is general manager.

The offices of The Rubber Association of Canada have been moved from the Royal Bank Building to 707 Reford Building, Bay and Wellington streets, Toronto, Canada. A. B. Hannay is manager and secretary.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Rubber Lining for Ball Mills

In connection with the article on this subject in the August number of The India Rubber World it may be well to state that the ball and tube mill is also largely used outside the mining industry. To mention two uses, there are the fine grinding of cement, where a rubber lining might prove satisfactory; then there is the grinding of calcined flints, china stone, bones, etc., in pottery manufacture, though open pan grinding is still largely used in England. Probably the rubber lining would suffer from the sharpness of the flints and particles of rubber would get into the slop. Whether this would be advantageous or disastrous to the production of china, the matter would have to be taken into consideration. Obviously experiments will have to be made with each class of material which is commonly ground in ball or tube mills and any references to the experimental grinding of ores should be amplified by a close description of the nature of the ore. Besides steel linings, silica linings are sometimes used.

Recovery of Rubber Solvent

A further useful contribution to this subject appeared in the July issue of The India Rubber World, written by P. W. Gumaer, and his remarks as to the economy of recovery, whether it can really be expected to pay or not, are worthy of careful consideration by those who cannot make up their minds to embark in the capital expenditure for installing a plant.

In his opinion it will be economical to install the self-contained condenser method of solvent recovery when the solvent used per hour on one machine costs one dollar or more. As he remarks, this question of economy is complicated by the fact that there are many kinds of solvent and many methods of use, but as far as the rubber trade is concerned there is really only coal tar solvent naphtha and the spreading machine to be considered, if we leave out of account the manufacture of cord tires. It is noticeable that the makers of recovery plants become more prominent when the price of naphtha is high, pointing out to prospective customers the savings to be expected, and it is rather unfortunate that the price of solvent shows such fluctuations.

It is pointed out that a great advantage of the self-contained plant is that no expert supervision, such as was required with older types of plant, is necessary. There are merely one or two taps to be turned. The author rightly states that while certain solvents such as pure benzol and carbon tetrachloride with definite boiling points yield a recovered product of the same composition, this is not the case with gasoline or naphtha where the 5 or 10 per cent of solvent which remains in the proofing is the heavier portion of the solvent. This slight alteration is quite unlikely to lead to any trouble, but its existence should be recognized so that, if necessary, steps to neutralize it may be taken.

The apparatus figured by the author is presumably that of the Benzine Condensation Co., of New York, N. Y., of which concern he is president, and in appearance it is very similar to the Volig recovery machine, made at Mill street, Pendleton Manchester. It is noteworthy that both these plants are opposed to the ideas of H. C. Young, who, in his recent important paper on rubber machinery before the Institution of Mechanical Engineers and Rubber Industry asserted that the proper way was to connect all the spreaders to a condensing plant outside the room.

New Cable Ship

The Siemens new cable ship, "Faraday," which was launched from the Jarrow yard of Palmers Shipbuilding & Iron Co., Limited, in March, came alongside the Woolwich Works of Siemens Bros. & Co., Limited, at the end of July to load about 1,000 miles of submarine telegraph cable for her maiden voyage. The vessel has a net tonnage of 2,640 tons and is 380 feet long between perpendiculars. There are four cable tanks with a total capacity of about 4,500 tons of cable, the mileage mentioned above representing nearly 4,000 tons. This is the new cable between Nova Scotia and New York for the Commercial Cable Co., Limited. It is single core insulated with gutta percha, the weight of the copper conductor being about 450 pounds per nautical mile. The armoring is of a special type as the cable passes largely over fishing ground where it is liable to be disturbed by ship's anchors.

Abbott, Anderson & Abbott Reorganized

Reference was made some time ago to the difficulties in which this old established London firm of waterproofers found themselves. A new company has now been registered under the same title and the business will be carried on at the old address, Dod street, Limehouse, London, E. The new company has a capital of £10,000 and no dividends may be declared until £9,200 of 5 per cent first mortgage debentures have been paid and a reserve fund of £5,000 has been created, though this fund may be employed in the business. The company starts with the good will of a business of long repute and should meet with success, though it cannot be said that the times are very propitious at the moment for this branch of the trade.

Isleworth Business to Continue

The Isleworth Rubber Co., Limited, is also in process of revival, though there is a want of unanimity among the creditors. The scheme for carrying on has been sanctioned by the Court subject to not less than £50,000, being subscribed in shares before February 8 next year, to which date the winding up petition was directed to stand over.

Financial Notes

The Swan Rubber Co., of Dukinfield, near Manchester, has had a receiving order made against its proprietor, T. C. Leigh, and the first meeting of creditors was held in Manchester at the end of August.

Luke Turner Co., Limited, is a private company with a capital of £200,000, formed to take over the important elastic web manufacturing business of A. Turner, long carried on at Leicester and other places. Mr. Turner is to be the first governing director. Leicester is the headquarters of the British elastic webbing industry and is the Mecca of those Continental and American travelers who wish to sell against the British Elastic Thread Manufacturers' Association.

Henley's Telegraph Works, Limited, has declared dividends for the half year of 4½ per cent on the preference shares and one shilling upon the ordinary shares, both tax free.

Steiner & Co., Limited, 21 Mincing Lane, London, E. C. 3, England, has recently opened a rubber department, under the supervision of E. Chandler, who has been connected with the industry for the past fourteen years. The Steiner organization was established in 1896.

The Barnet Glass Rubber Co., Limited, of Melbourne, Australia, proposes to reduce its capital by writing down the value of the ordinary shares from £1 to 14 shillings, thus cancelling 6 shillings per share. A petition to carry this out has been presented to the Australian Court and it will no doubt be acceded to, as the company has lost about £90,000 of its capital of £500,000, nearly all of which was paid up.

Institution of Rubber Industry Program

Plans are being completed for the coming sessions of the Institution of the Rubber Industry, and the following papers will be read at the 1923-4 meetings, the London sessions being held at the "Kelvin" Room of the Engineers' Club, Coventry street, London, W., England.

London Section

September 17, "Rubber Floors and Rubber Roadways," by Evan J. Edwards. October 1, "Plantation Life from a Topical Point of View," by Cyril Baxendale. November 5, "Salesmanship," by A. H. Williams. December 3, "Accelerators," by V. Lefebure. January 7, 1924, "Consistency of Rubber and Rubber Compounds," by Samuel S. Pickles. February 4, "The Use of Rubber Latex in the Manufacture of Boards, Leather and Linoleum Substitutes and as to the Vulcanization of these Products," by Frederick Kaye. March 3, "Life and Work of Thomas Hancock," by Herbert Rogers and B. D. Porritt. April 7, "Solid Tires," by W. Bond. May 5, "The Rubber Industry—a Plea for Closer Working," by James Fairbairn.

Manchester Section

Meetings will be held in Banqueting Hall, Midland Hotel, Manchester, England.

October 15, Discussion, "Rubber Machinery," led by H. C. Young. November 19, "Costing in the Rubber Industry as an Essential Factor to Successful Production," by C. A. Freyer. December 7, joint meeting with the Society of Chemical Industry—"The Analysis of Rubber Vulcanizing Accelerators," by T. Callan. February 18, 1924, Proposed American Night. March 17, "Selling Rubber Goods," by E. E. Buckleton.

Birmingham Section

In October, "The Vulcanization Process from its Inception to the Present Day," by B. D. W. Luff.

Edinburgh Section

One meeting in course of arrangement. The date and place of Birmingham and Edinburgh meetings will be announced at an early date.

The Rubber Trade in Europe

By Our Regular Correspondent

France

Under the title of Michelin & Cie, Societé d'exportation, a limited joint stock company has been formed between M. Marcel Michelin and a silent partner. Its object is trade in all products of the Michelin trade mark in countries outside of France where there is no branch or general agency of the Michelin company. Headquarters are at Clermont-Ferrand. The capital is 500,000 francs.

At the Industrial and Commercial Exposition of Thann (Upper Rhine), organized by the Chambers of Crafts of Alsace and Lorraine, the Alsatian rubber manufacturing concern, J. Rollin & Cie, Steinbach, was awarded a gold medal. The firm exhibited ebonite articles, grain elevator belting of rubber, sheet for packing, matting, rubberized canvas hose, rubber cased cylinders and the like.

Owing to the fall in French exchange, American tires find it difficult to compete with French and Italian makes. In the city of Lyon Michelin leads, with Dunlop, French Goodrich, Bergougnan, Hutchinson, an American make, and Pirelli following in the order named.

Michelin Produces Cord Balloon Tires

It is reported that Michelin has perfected a type of low-pressure balloon tire, and will place it on the market at the Paris automobile show in October. These "comfort tires," the term used by Michelin for the new type, are of clincher bead cord construction and are to be used on small, light cars. They are designed to replace the 700 by 80, 710 by 90, and 765 by 90 tires used on such cars as the small Citroen, Renault, and other popular models with engines of 67 cu. in. or less.

Instead of the normal section of 80 or 90 mm., the new tires are 130 mm. section, and instead of the normal 50 to 60 pounds pressure they are inflated only to 18 to 20 pounds. These tires are designed for cars weighing 800 pounds rather than for those of 2,000 pounds.

France Leads in Imports of American Artificial Leather

Exports of leather cloth or artificial leather now represent one of our leading classes of shipments to Europe, several countries, including France, England, Sweden, Spain, and Denmark, buying largely during the present year. France, however, far outdistanced all other countries in her purchases of such goods, and with a total for 1922 valued at $441,246, has already, during the first six months of 1923, reached the figure of $321,770. Totals, showing a steady increase in France's imports, are as follows: January, $50,657; February, $17,120; March, $60,565; April, $42,630; May, $67,419; and June, $83,379.

Czechoslovakia

Unfavorable weather conditions in the spring and early summer are held responsible for the marked falling off in the demand for automobile tires. The Continental, once popular, is reported to be losing ground here owing, it is claimed, to deterioration in quality. Michelin is in the lead, although Dunlop and certain American tires are also well liked.

The commercial treaty between Czechoslovakia and France, signed on August 17 and effective from September 1, will aid in strengthening the position of French tires here. Under its provisions the duty on automobile tires imported from France was reduced from 30 crowns per kilo to 15 crowns per kilo, and it is reported that in consequence of this reduction, Michelin has offered the Praga automobile factory a ten per cent reduction on their tire requirements. A general price reduction on Michelin tires is expected.

Sweden

About 30 per cent of the tires sold in Sweden at present are Dunlops, but it seems that Dunlop is losing ground because the quality does not always come up to expectations. Over against this we find that Michelin is preparing to compete more seriously. It is said that the local agency of this company is being thoroughly reorganized, and as in addition the low French franc is in its favor, keen competition may be expected.

Poland

According to Polish Government figures the three factories now working have a combined monthly output of 20,000 pieces of rubber hose, 13,000 kilos of various technical manufactured goods and 8,000 bicycle tires. These factories are of recent growth and employ 300 workmen. One new factory is to start work soon. One of the oldest factories in the territory now belonging to Poland is not working owing to lack of capital. In addition to these, there is one small factory in Warsaw which manufactures a few rubber toilet articles.

Holland

Figures for imports of rubber tires during the first half of 1923 show an increase of nearly fifty per cent in quantity, but on the other hand there is a decrease in value averaging 50 per cent per tire. Thus during the first six months of 1922 there were imported 26,122 tires at an average value of 21.9 gilders, while in the corresponding period of 1923 imports amounted to 34,091 tires at an average value of 14.8 gilders.

French manufacturers have led in the reduction of prices which has increased their lead in trade here. America and Great Britain have not been able to hold their own. Germany has increased its

trade materially in all respects while the increase in imports from Belgium has been considerable.

Belgium

In 1922, England led in the total amounts of rubber goods exported to Belgium (excluding tires), the figures being 371,263 kilos, value 5,356,126 francs; France was a close second, with 351,928 kilos, value 5,038,715 francs. However France was far ahead in the matter of automobile tires, of which she sent 535,510 kilos valued at 9,859,331 francs; next came England with 420,908 kilos, but value only 2,820,517 francs. America shipped 66,733 kilos of tires worth 1,167,243 francs.

The English goods particularly in demand here comprise belting, garden hose and hose for breweries.

Germany

The German situation has now reached the stage where it seems to the outsider that any calculation in marks is futile. There is probably a reason for the continued quoting and paying in marks that are not worth the paper on which they are printed. Whatever the object may be it is not based on reason as it apparently adds to the confusion.

For instance, the price convention of German surgical hard and soft rubber goods in announcing rates as from August 26, 1923, says that the bills are to be made out at basic prices multiplied by the hundredth part of the latest dollar rate quoted on the Berlin exchange, or at least at basic prices multiplied by the minimum multiplicator, which for the present has been fixed at 50,000. Payment is to be made within 7 days of the date of bill; for each day over this limit 2 per cent is to be paid.

The new prices for rubber coats range from 24,000 per cent to 13,000 per cent higher according to date of order. Wages have been increased; extra allowance, due to higher cost of living, from 2,886,000 to 5,916,400 per cent; time wages, 105 per cent. Jar-rings are 8,000 to 12,000 marks each.

The worst sufferer under present conditions is perhaps the middleman, who must pay cash to the manufacturer, give credit to his customer and run the risk of losing millions of marks from one day to the next.

The wonder is that any business at all is being done now. There is difficulty in obtaining raw materials owing to excessive prices; however, on the whole manufacturers are still fairly busy.

The Occupied Territory

Press reports of conditions in the occupied districts show that at present there is a shortage of rubber goods accompanied, of course, by a lively demand and exorbitant prices. There are enough rubber heels, soles, and jar rings on hand, principally of German make, and these are selling at staggering prices. Most of the stores offer their wares priced in dollars, francs, gilders or goldmarks, which makes it necessary for the prospective buyer to supply himself with foreign bills and this hampers trade.

Tire casings for bicycles are 750,000 to 1,000,000 marks each. supply himself with foreign bills and this hampers trade.
are quoted at 2,000,000 to 3,000,000 marks each. As for prices of automobile tires, these are almost unbelievable. A set of four tires, two spare tires and tubes, runs into billions of marks! The demand for hard and soft rubber goods for purposes technical and surgical, for sporting goods and notions, is good.

Leipzig Fair

The Leipzig Fall Fair has never been so disappointing. Very little business was done and the whole atmosphere was one of great quietness. Few English and Americans attended the fair. The interest from other foreign lands was hardly greater, except perhaps in the case of Holland, Italy, and Czecho-Slovakia. Small wonder that sellers were inclined to make concessions and sold at firm prices and at firm dates of delivery. Not only this, but it was also noted that sellers came down on their prices!

Rubber Salvage Equipment

The importance of rubber in salvage equipment is pointed out by the *Gummi-Zeitung*, which describes the new type of diving suit and diving bell. Instead of tubes connecting diver and ship, an apparatus attached to the diver's back supplies oxygen and purifies the air. The suit itself is made of rubberized double-coated fabric, and telephone cable is also part of the equipment.

Diving bells use rubber packing rings and cord, rubber sieves, valve balls, and buffers. Rubber is used to prevent displacement of ropes and hawsers, and to permit the diver to rise rapidly to the surface. He is encased in an inflated rubber waistcoat.

Safety Devices and Other Machinery

A new safety device for use in rubber factories comprises a catcher beam for bias cutting machines. The new device automatically draws forth the fabric after each cut. It is made by the Maschinen-fabrik Ch. Mansfeld, Leipzig.

Another invention consists of a hydraulic table, arranged close to the tire-vulcanizer, which can be raised and lowered, whereby the molds are handled to and from the vulcanizer.

The Maschinenfabrik Moenus A.-G., Frankfort-am-Main, has recently developed a new overflow trimming machine for rubber packing for brakes and water gage glasses, heel patches and the like. It is also provided with a safety device calculated to give the utmost protection to the worker.

European Notes

Most of the bathing caps and dress shields used in Switzerland come from America, dealers complaining that the German wares are "cheap and shoddy." The centers of this trade, in order of importance, are Zurich, Basel, and Geneva. American bathing caps retail from 2 to 10 Swiss francs, or from $0.35 to $1.75 at present exchange rates. Quotations to Swiss buyers should preferably be made c. i. f. Antwerp or Genoa, in Swiss francs.

The "Liberia" supercord tire has been placed on the French market. It is manufactured by the National Union Rubber Co., of Brussels, Belgium, and is offered at the same price as the Michelin cord.

The most popular makes of tires in Bulgaria are Pirelli, French Goodrich, Continental, and Martini (Italian). The 30 by 3½ cord sells at 2,200 to 2,300 leva (1 lev equals $0.009 at present exchange).

A merging of two leading rubber companies of Austria has been recently reported, the Semperit Rubber Manufacturing Co. having acquired all the shares of the Wimpassing Co. The latter firm manufactures rubbers, arctics, hard rubber goods (chiefly combs), surgical appliances, tires, raincoats, and sporting goods. It employs 1,000 persons, while the Semperit works have 6,000 employes. The Semperit firm now controls the five principal rubber factories in Austria and also has controlling interests in a number of affiliated firms and sales companies in the rubber industry.

PARIS TO HAVE INDEPENDENT RUBBER MARKET

Press reports state that with the beginning of October a raw rubber market will be established at the Bourse du Commerce, Paris, France, where goods will be sold delivered at either Paris, Marseilles, Havre, or London. The measure is calculated to make the country independent of the London and other foreign rubber markets, creating a national business and national stocks, which give the country added security against aggression and a greater demand for national shipping.

It should at the same time cause the colonies, like Indo-China, to produce more rubber, and induce growers to plant bigger areas. In this way such colonies can eventually supply a larger portion of the 28,000 tons of raw rubber which France now consumes every year. The members of the board responsible for this extensive project include representatives of banking and industrial associations, connected with Indo-China and other tropically situated colonies.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

We have now had nine months of restriction and after all the adverse criticism heaped on the scheme, it is stimulating to go over the analysis of prices prepared by the *Straits Times*.

Over the first quarter with 40 per cent restriction the average price was 51½ cents per pound; the average for each month was 44 cents over November, 1922; 49 cents over December, 1922; 62 cents over January, 1923. For the second quarter, at 40 per cent restriction the average was 59 cents, the monthly averages being: February, 62 cents; March, 59 cents; April, 56 cents. The third quarter, with 35 per cent restriction, showed a decrease to 49 cents, the average for May being 50¾ cents; for June, 49¼ cents; for July, 48 cents.

These averages are based on each day's top price for Singapore standard ribbed smoked sheet as given in the Chamber of Commerce daily report. As the price during the last quarter fell below 1*s.* 3*d.* per pound, the rate of restriction will again be 40 per cent.

Against these figures are to be placed those for the quarter July-September, 1922, which averaged 25 cents over the quarter and 26 cents, 24½ cents and 25 cents, respectively, for each of the three months included in that period.

To those asking whether the restriction policy has been a failure, the *Straits Times* further answers with a few more comparisons. The average price for nine months under restriction was 53 cents per pound, while for three months before restriction this was 25 cents, which shows a gain of 28 cents per pound. Again, an estate with full production capacity of 30,000 pounds per month, selling at 25 cents and deducting 22 cents all-in cost, would have a profit of $900; whereas the same estate, restricting by 40 per cent and producing therefore 18,000 pounds, sold at 53 cents would have net profit, after deducting 30 cents per pound all-in costs, of $4,140. Of course few estates could harvest the full crop at 22 cents a pound, while most could collect a restricted crop at 30 cents.

A Year's Notice of Restriction Withdrawal

Certain unofficial members of the Federal Council and the General Committee of the Federated Malay States Chamber of Commerce, expressed the view that a year's notice should be given by the Government before withdrawal of the Stevenson restriction scheme. This suggestion is receiving a good deal of opposition from representative persons and papers who consider that this proposed amendment to the restriction enactment would lead to huge stocks of rubber being piled up which of course would be dumped on the market as soon as restriction was declared at an end and thus would, in a great measure, undo the work of the scheme. It is also the opinion that such notice would not only give the planters an incentive to hoard but would give manufacturers in general—but those on the other side of the Atlantic particularly—a splendid opportunity to hatch some nice little plans to trap the Malayan planter.

The advocates of a year's notice claim that this is necessary in order to enable the planter to recruit a sufficient labor force to cope with the work necessary for standard production. Furthermore, a change in the English political situation might bring a government into power that would insist on withdrawal of the restriction scheme, when such notice would be necessary.

To this the opposite party answers that the continued and steady rise in prices would be sufficient notice for planters that the end of restriction was not far off. It is also evident that if labor has had to be dismissed owing to 40 per cent restriction, more coolies will have to be employed when restriction is say 20 or 10 per cent and that so long as prices continue to rise, planters will have to keep on adding to their labor force. In other words, due to the sliding scale of restriction, a sudden need for heavy recruiting is out of the question.

As for the political change, the *Malayan Tin and Rubber Journal* thinks that the only government likely to insist on instant repeal of the restriction bill would be a labor government and that the chance of such a government coming into power in Great Britain within the next five years is not worth considering.

Rubber Stocks

On June 30, 1923, a census of all stocks in the hands of dealers, on estates and on the railways, was held in the Straits Settlements. Returns were received from 313 dealers in Singapore, 139 in Penang, 88 in Malacca, in all 540 dealers. The total stocks declared amounted to 21,645.7 tons, of which 16,917.1 tons were in Singapore, 3,651.4 tons in Penang and 1,077.2 tons in Malacca. These figures show a reduction of 6,679 tons over those obtained at the census held on December 31, 1921, when dealers' stocks amounted to 28,324 tons. However, in October, 1922, there was a heavy increase in stocks due to abnormal exports from the mainland which were about 19,000 tons in excess of the monthly average. At least 13,000 tons of this rubber were in Singapore and Penang on November 1, so that it is estimated that stocks in the Straits Settlements have been reduced by nearly 20,000 tons since the commencement of restriction.

The stocks on 922 estates of 25 acres and over totaled 2,280.4 tons. Stocks held by 235 estates in Singapore were 325.9 tons; by 38 Penang estates, 13.6 tons; by 100 Province Wellesley and Dindings estates, 466.4 tons, and by 450 Malacca estates, 1,471.8 tons. At the census of December 31, 1921, stocks on estates in the Straits Settlements totaled 2,945 tons, or 664.6 tons more than at present.

The railway census was not as complete as in 1921. The returns on June 30 showed 704.9 tons here against 1,104.1 tons in 1921, a decrease of 399.2 tons. The total stocks at the last census were 32,373.1 tons as compared with 24,631 tons at the present census, that is 7,742.1 tons less.

The rubber which passed through the customs during June came to 3,705,045 pounds from the Straits Settlements (excluding Singapore and Penang); 17,142,325 for the Federated Malay States and 10,014,206 pounds for the Unfederated Malay States—in all 30,861,576 pounds.

New Plantings

At a recent meeting of the Seremban Rubber Estates, Limited, Sir Stanley Bois, in the course of an address, pointed out that if present indications may be trusted the need for extension of plantings is present. The Stevenson scheme undoubtedly rescued many estates from utter ruin; however, if American expectations regarding the demand for rubber goods are realized and if this demand continues at the same ratio as in the past, fresh plantings will be needed to fulfill the needs which will arise in from 5 to 10 years' time. As fresh capital probably will not be attracted until rubber rises to something like 2*s.* a pound, and as increased knowledge of the scientific exploitation of rubber points to more conservative methods of tapping and consequent reduced output per acre, the argument for extension of planting is strengthened.

Local Exhibition

The Malayan Agri-Horticultural Association held a very successful exhibition here from June 30 to July 2, 1923. In the Agricultural Section were the rubber exhibits comprising crêpe sheet,

Pará block, slab, compo crêpe, smoked and unsmoked sheet, as well as some samples of local manufacturers, as slippers, heels, mats, tires, tiles, soles, latex pans of rubber vulcanized by the Laub process, and the like.

The Warduburn Estate won the gold medal awarded by the Rubber Growers' Association for the best exhibit of pale crêpe. The silver cup presented by the Planters' Association of Malaya for the best smoked sheet was also won by the above estate.

Malayan Notes

The *Malay Mail*, to encourage the use of latex paper, has decided to give its readers an issue printed on rubber latex paper. It is the first daily newspaper to make the experiment.

During June, 1923, Malaya exported 2,274 gallons of rubber latex valued at $4,208, as compared with 355 gallons, value $1,286 in June of last year when rubber was first shipped in this form from Malaya. For the first six months of 1923, the figures are 56,954 gallons, value $92,533.

Netherlands East Indies

The Commercial Association of Medan (Sumatra) in reviewing the rubber position, gives some interesting figures regarding production, stocks and consumption.

During the first half of 1923 Malaya exported something like 130,000 tons of rubber. On this basis the exports from this source would be 260,000 tons for the year. However, it may be assumed that restriction will be more strictly enforced and that therefore the exports for 1923 from Malaya will be about 200,000 tons. The figures for the other sources are estimated at 100,000 tons for the Dutch colonies, 25,000 tons for Brazil, 40,000 tons for Ceylon, and 20,000 tons from various sources, altogether 185,000 tons plus 200,000 tons from Malaya, or a total of less than 400,000 tons.

The consumption figures of America only are considered and we learn that for the first quarter these were 87,100 tons, which beats all records, for the consumption during the first half of 1922 and of 1921 was 114,624 tons and 58,913 tons, respectively. Stocks at the end of March, 1923, consisted of 75,120 tons of plantation rubber, and 5,809 tons of Pará rubber, while about 45,000 tons were in transit.

A consumption of 87,000 tons for the first quarter of 1923 would mean around 350,000 tons for the whole year; but as the figures are for 90 per cent of the consumers, the real total would be higher than this. Granting that America's business has reached the peak of prosperity and that a decline in activities and consequent consumption is to be expected before the end of the year, nevertheless, the association in question is of opinion that it is safe to estimate that America's needs for the year will come to 325,000 tons. The world consumption would be 425,000 tons, so that the position of rubber will be very sound if restriction is taken up in earnest in the British Colonies, although restriction of 40 per cent would not even be necessary.

Is Capital Neglecting the Dutch Colonies?

This question is occupying many minds here at present and the answer very often found for it is in the affirmative. The explanation for this is generally given as high taxes and the intended abolition of the so-called Penal Sanction regarding labor.

A comparison has been made between conditions in the Dutch colonies and other tropical lands, Malaya and Indo-China for instance, and it must be admitted that from this examination the Dutch possessions do not emerge triumphant. Thus it was shown that whereas foreign capital is received with open arms in other colonies, it gets a very indifferent kind of reception here.

From other points of view Indo-China is declared as being attractive to investors. There is sufficient labor there, the government cooperates with enterprises, and fine lands for many agricultural purposes are obtainable.

It is shown that many large foreign firms have abandoned plans they had for extending their activities in Sumatra and are diverting their capital to other fields. It is said that the Holland-American Plantation Co. has invested at least 14 million gilders in Malaya which might have been put into Sumatran enterprises.

It is finally pointed out that at present, when chaos still prevails in Europe and capital is shy as regards risking anything there, the Dutch colonies should seek to benefit by these conditions and offer inducements to capital instead of scaring money away by taxes and the like.

The "Penal Sanction"

That the government here realizes that foreign capital is unwilling to take chances in Sumatra owing to the proposed abolition of the Penal Sanction and is seeing the necessity for some change of front is evident from the recently published text of an amendment to the coolie laws which is to be taken up here before being finally settled in the Netherlands. The Penal Sanction, be it known, permits the employment of contract labor and confers certain privileges on the employer, and the intention of abolishing contract labor and substituting for it free labor has aroused a good deal of acrid discussion in Sumatra, which would be the chief sufferer as it has a comparatively small population and labor needed for work on the numerous extensive estates has had to be imported from Java. The Penal Sanction gave the employer the certainty that the labor he went to the trouble and expense of importing would work for him for a stated period and the special privileges enabled him to enforce the terms of the contract. On the other hand there were also certain provisions to safeguard the coolie from harsh employers.

Modern Methods of Cultivation

The *Archief voor de Rubbercultuur* publishes a rather lengthy article by J. G. J. A. Maas on the subject of modern methods of cultivation. The writer first shows how after various rubber-bearing trees had been found Hevea was recognized to be most worthy of exploitation. Having once picked out the right kind of plant, the next step was to find the right method of cultivating it, and in the last years many changes have taken place as regards tapping, upkeep, selection and the like. As regards tapping, while in the early years trees were bled daily and generally twice daily, it is now being more and more recognized that periodical tapping is the most economical method. At present the usual system is to tap every other day, but there is an increasing number of estates where trees are tapped daily for a certain length of time—one, two or three months—and then rested for about the same length of time.

The problem now confronting the planters is how high and how long production can be maintained, and, when the decline comes, what to substitute for the old trees.

This leads to the question of seed-selection and of bud-grafting. Of late a good many authorities have urged caution regarding bud-grafting, and some are frankly pessimistic. At a recent gathering of planters, the point was put forward that very high yields were abnormal and were often the precursors of disease; that they were in fact a warning against working for such high yields; there was a possibility that in this way trees might become delicate and that diseases which they now resist with ease might become a serious menace.

Mr. Maas is frankly optimistic; he cites several examples from various estates to show that the yields from grafted trees are higher than from seedlings.

In spite of this, however, he cautiously advises planters to make use of both buddings and seedlings.

ARGENTINA IMPORTED DURING JANUARY AND MARCH RESPECTIVELY of the present year 128,000 pairs of our canvas shoes with rubber soles valued at $98,915, and 172,750 pairs valued at $131,963, a total for the two months of 300,750 pairs, valued at $230,878. Her purchases of such goods during the entire year 1922 amounted to 463,432 pairs, estimated at $369,526.

Recent Patents Relating to Rubber

The United States

Issued* July 31, 1923

NO. 1,463,260 Demountable rim. A. L. Fouche, Atlanta, Ga.
1,463,390 Breath mask. A. Fernandes, Kansas City, Mo.
1,463,428 Detachable heel. C. W. Lavers, Halifax, Nova Scotia, Canada.

1,463,429 Tire shoe. M. D. Logan, Los Angeles, Calif.
1,463,531 Shoe ornament. G. C. Kennedy, Waterloo, Iowa.
1,463,553 Elastic section belt. L. A. Lasater, Houston, Texas.
1,463,596 Transmission belt. J. S. Schade, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,463,655 Cushion connection for vehicle springs. A. F. Masury and A. H. Leipert, assignors to International Motor Co.—all of New York.
1,463,682 Cushion wheel and tire. M. J. Duffy, Brooklyn, N. Y.
1,463,688 Presser pad. H. Gordon, assignor to Selby Shoe Co.—both of Portsmouth, Ohio.
1,463,732 Device for riveting half soles on pneumatic rubber tires. R. C. Turner, assignor to E. T. Alston, both of Seattle, Washington.
1,463,742 Inner tube. G. A. Lane, assignor of one-half to I. A. Chappel and one-half to J. C. Hayes, all of Lorain, Ohio.

Issued* August 7, 1923

1,463,833 Corset with elastic gusset. C. Munter, New York, N. Y.
1,463,914 Permanent substitute tire. J. Toren, Chicago, Ill.
1,463,926 Swimming mask. E. F. Schneidt, Detroit, Mich.
1,463,968 Denture. J. Petry, Pittsburgh, Pa.
1,464,033 Combined pneumatic and cushion tire. W. Drury, Hammersmith, London, England.
1,464,057 Crutch tip. W. G. Bell, Philadelphia, Pa.
1,464,085 Sectional pneumatic tire. Mitsujiro Motoki and Chusuke Yagi—both of Tokyo-Fu, Japan.
1,464,107 Inflatable toy. T. W. Pedersen, assignor to H. I. Wagner Co.—both of New York.
1,464,206 Rawhide protected casing. F. L. La Tulip, Los Angeles, Calif., assignor of five-eighths to W. D. Nicholson, Long Beach, Calif.
1,464,236 Windshield cleaner. L. T. Berry, San Francisco, Calif.
1,464,342 Clamping yoke for rubber overshoes. F. J. Rothacher, Minneapolis, Minn.
1,464,376 Combination valve and dust cap. W. W. Wainwright, Tacoma, Washington.
1,464,425 Safety valve and pressure indicator for automobile tires. W. E. Hedger, Waupun, Wisconsin.
1,464,432 Hat-retaining device with elastic strip. O. H. Lemcke, New York, N. Y.

Issued* August 14, 1923

1,464,590 Semi-pneumatic tire. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,464,709 Cushion tire. M. J. Herzog, New York, N. Y.
1,464,716 Printer's rubber blanket. H. A. King, Portland, and E. O. Isler, Hillsdale, Oregon.
1,464,786 Cushion tire. W. von Kothen, Kansas City, Mo.
1,465,002 Teat cup. P. Schawang, St. Paul, Minn.
1,465,033 Rubber paving and flooring block or slab. W. A. Williams, assignor to The North British Rubber Co.—both of Edinburgh, Scotland.
1,465,051 Rubber washboard. D. D. Lenner, Akron, Ohio.
1,465,070 Demountable split rim. P. A. White, Long Island City, N. Y.
1,465,096 Rim. P. Schultz, Wauchula, Florida.
1,465,104 Corset with flexible inserts. M. Von Halle, Palisades Park, N. J., assignor to The Standard Corset Co., New York, N. Y.
1,465,125 Cushion wheel. V. Gil-Delgado, Madrid, Spain.
1,465,159 Demountable rim. S. S. Davis, Bloomfield, Mo.
1,465,169 Armored tire. F. O. Muro, Buenos Aires, Argentina.
1,465,180 Rubber shoe retainer. R. S. Rowe and G. Weinle, Rutland, Vermont.
1,465,196 Demountable rim. J. E. Wander, Washington, D. C.
1,465,201 Wheel and tire construction. E. H. Ackerman, Montclair, N. J.
1,465,207 Siphoning device. F. M. Bonheim, St. Louis, Mo.
1,465,223 Handband or protector for baseball players. E. Kobbe, Brooklyn, N. Y.

Issued* August 21, 1923

1,465,354 Demountable rim. R. J. Donogh, New York, N. Y.
1,465,376 Armored tire. J. F. Stranahan, assignor of one-half to J. F. Mora—both of Pittsburgh, Calif.
1,465,476 Resilient vehicle wheel. F. C. Lane, Houston, Texas.
1,465,697 Stone guard for dual pneumatic tires. S. P. Thacher, Freehold, N. J., assignor to Morgan & Wright, a corporation of Michigan.
1,465,725 Self-registering pressure gage. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., New York, N. Y.
1,465,726 Self-registering pressure gage. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,465,748 Attachment for nursing nipples. C. H. Weld, Glencoe, Ill., assignor of one-third to R. B. Weld, Bowden, North Dakota.
1,465,775 Heel mold. W. Bernstein, Jamaica Plain, assignor to Panther Rubber Manufacturing Co., Stoughton, both in Massachusetts.
1,465,867 Inner tube. J. Riley, West Durham, N. C.
1,465,889 Divided casing with detachable tread. R. Wright, Cleveland, Ohio.
1,465,896 Snap-on rubber heel. C. F. Donigan, Newark, N. J.
1,465,898 A non-pneumatic resilient filler for a tire shoe. C. A. Fisk, New York, N. Y.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Issued* August 28, 1923

1,465,967 Slitting and rewinding machine. J. A. Cameron and G. B. Birch, assignors to Cameron Machine Co.—all in Brooklyn, N. Y.
1,466,094 Squeeze roll with rubber sections. F. L. Furbush, assignor to C. G. Sargent's Sons Corp.—both in Massachusetts.
1,466,133 Cushion tire. C. G. Lundstrom, Boone, Iowa.
1,466,210 Rubber-tired wheel. H. J. Ferris, assignor to Hunt, Helm, Ferris & Co.—both of Harvard, Ill.
1,466,318 Airbag for curing tires. H. F. Waters, assignor to K. C. Schuyler—both of Denver, Colo.
1,466,366 Expansible spring core for tires. P. R. E. Lehmann, Dayton, Ohio.
1,466,386 Sponge rubber arch support. D. P. Smith, Meriden, Conn.
1,466,407 Detachable rubber heel. W. A. Maloney, Newton, Mass.
1,466,498 Solid tire with spring core. H. C. Fitch, Demos, Ohio.
1,466,522 Cushion tire. P. Di Cesare, assignor to The Ceasar Resilient Tire Corp.—both in New York.
1,466,609 Rubber ball. J. W. Weaver, Lebanon, Pa.
1,466,641 Rubber and cushioned packing. J. T. Crane, Maywood, assignor to Chicago Metallic Packing Co., Chicago, both in Illinois.

The Dominion of Canada

Granted July 31, 1923

233,098 Pneumatic tire. W. Seward, Seaford, N. Y.
233,100 Rubber handle grip for golf clubs. H. W. Smith, Akron, Ohio.
233,127 Athletic supporter. Bauer & Black, Chicago, Illinois, assignee to W. F. Jenkins, New Rochelle, N. Y.

Granted August 7, 1923

233,227 Puncture-proof inner tube. E. Fetter, Baltimore, Md.
233,237 Pneumatic cushion for heels. J. J. Halloran, Daly City, Calif.
233,242 Rubber band tire. E. B. Killen, London, E. C. 4, England.
233,243 Outer treading circumference of tires. E. B. Killen, London, E. C. 4, England.
233,249 Inner tube with puncture healing properties. D. S. Myers, Chicago, Ill.
233,265 Protective insulating sleeve. M. B. Salisbury, Chicago, Ill.
233,281 Rubber overshoe. W. B. Wiegang, Montreal, Quebec, Canada.
233,288 Rubber footwear. The Ames Holden McCready, Ltd., Montreal, Quebec, assignee of P. Y. Smiley and F. W. Knibbs, both of Kitchener, Ontario, all in Canada.
233,304 Interchangeable rubber heel. The Double Wear Interchangeable Heels, Ltd., assignee of C. W. Lavers—both of Halifax, Nova Scotia, Canada.
233,311 Crutch tip. The Hipwood Suction Tip Co., New York City, assignee to G. Hipwood, Brooklyn—both in New York.
233,340 Water bag. The Seamless Rubber Co., Inc., assignee of J. W. Patterson, both of New Haven, Conn.
233,363 Self-healing tube. H. H. Hastings, Toronto, Ontario, Canada, assignee of E. Fetter, Baltimore, Md.
233,372 Tire valve. A. B. George, Listowell, Ontario, Canada.

Granted August 14, 1923

233,415 Tire valve. R. S. Burn. Birmingham, England.
233,454 Combined toy balloon and sweetmeat. G. Ingram, London, England.
233,490 Life preserver. G. Senatore, Brooklyn, N. Y.
233,593 Life preserver. G. H. Pallady, Redondo Beach, California.

Granted August 21, 1923

233,688 Rubber heel with air chamber. G. F. Quinn, Revere, Mass.

Chemical Patents will be found on Page 27, Machinery and Process Patents on Pages 32-33.

Granted August 28, 1923

233,843 Horseshoe with resilient member. W. J. Twiss, High River, Alberta, Canada.

233,872 Necktie with resilient body material. The Franc-Strohmenger & Cowan, Inc., assignee of J. E. Langsdorf, both of New York City, N. Y.

233,897 Inner tube. I. A. Chappell and J. C. Hayes, assignees of G. A. Lane, assignee of one-third of the interest, all of Lorain, Ohio.

The United Kingdom

Published July 25, 1923

198,232 Tire gaiters. A. W. Thomson, 45 Albert Road, Stroud Green, London, England.

198,259 Veil with elastic edge. A. Burnet and A. Burnet & Co., 48 Golden Lane, London, England.

198,273 Revoluble protectors for soles and heels. V. Possnett, 111 Bangor street, and S. Jackson, 137 Edgeley Road—both in Stockport, England.

198,283 Cushion tire. J. Guerrero, Vieux Chateau, Luzarches, France.

198,292 Rubber door mats. E. L. Curbishley, Xylos Rubber Co., Trafford Park, Manchester, England.

198,334 Machine for building tire covers. Hartford Rubber Works Co., 691 Park street, Hartford, Connecticut, U. S. A., assignees of W. J. Steinle, 561 West 58th street, New York, N. Y., U. S. A.

198,338 Diaphragm pumps. Dorr Co., 101 Park avenue, Manhattan, New York, U. S. A., assignees of E. C. Reybold, 1231 Clayton street, Denver, Colorado, U. S. A.

198,352 Combination undergarment with elastic inserts. E. R. Parks (nee Ray), 208 Rue de Rivoli, Paris, France.

198,402 Apparatus for stripping tires, etc., from cores. T. Sloper, Southgate, Devizes, Wiltshire, England.

198,409 Rubber calked horseshoes. F. S. Plant, Bridge House, Deeping Gate, near Peterborough, England.

Published August 1, 1923

198,593 Dress shields. A. E. White, 88 Chancery Lane, London. For service in the United States address: I. B. Kleinert Rubber Co., 485 Fifth avenue, New York, U. S. A.

198,600 Cushion wheel. R. Grieve, 432 S. Walnut street, and J. W. Flading, 829 N. Walnut street, both in Lansing, Michigan, U. S. A.

198,604 Rubber padded driving-belt. L. J. Essenhigh, 3 Woodbine Terrace, Grappenhall Road, Warrington, Lancashire, England.

198,620 Water-filled inner tube core. A. V. Alexander, 13a Earl's Court Square, London, England.

198,709 Combination road and rail tire. F. P. Griffith, J. Lindsay, and H. G. Geoghegan, 17 Westland Row, Dublin, Ireland.

198,774 Woven fabrics for tires. J. P. Stockton, 825 Kilsythe Road, Elizabeth, New Jersey, U. S. A.

198,886 Air-chambered leather heel with rubber insert. A. K. Pomeroy, Rockville, Montgomery, Maryland, U. S. A.

198,905 Device to limit the extension of the elastic parts of corsets. F. Longdon & Co., Ltd., Agard street, and W. J. Osborn, 74, Belper Road, both in Derby, England.

198,906 Tire valve. R. G. Old, 37 Limes Road, and F. W. Hill, 138 Dover Road, both in Folkestone, England.

198,935 Hose Coupling with rubber joint. J. C. Spencer, 2 Central Buildings, Westminster, England.

198,951 Rubber covers for jars. R. Allen, 22 Mather street, Kearsley, Lancashire, England.

198,953 Armored tire. R. von Krenski, 46 Rubenstrasse, Friedenau, Berlin, Germany.

198,956 Detachable rubber sole. G. E. Johansson, 19 Andra Laanggatan, Goteborg, Sweden.

198,959 Garter fastening. H. S. Jones, 58 Lancaster Gate, London, England.

198,962 Rubber lift for valve. H. Morley, Pinewood, Broad Road, Sale, near Manchester, England.

Published August 9, 1923

199,041 Surgical truss with elastic bands. D. Perissinotti, 22 Via Bochetto, Milan, Italy.

199,115 Rubber caps for telephone instruments. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London, England.

199,121 Tank with self-sealing coating of sheet rubber. S. C. Mote, 106 Cannon street, London, England.

199,159 Stands and mats with rubber suction caps. O. L. Eugster, Barnsbury Works, Barnsbury street, London, England.

199,168 Rubber handles for bicycles. F. H. Bluemel, Cannon Hill, Kenilworth Road, Coventry, and Bluemel Bros., Ltd., Wolston, near Coventry, England.

199,199 Dish cover with rubber table protector. T. G. Blood, 32 William street North, Summer Lane, Birmingham, England.

199,254 Combination pneumatic and solid tire rim. W. McCahey, Graham Gardens, Lisburn, Co. Antrim, Ireland.

199,331 Truss with elastic straps. A. E. Shaw, 555 Liverpool Road, London, England.

Published August 15, 1923

199,605 Rubber heel. J. P. Mullins, The Laurels, Hare Lane, Claygate, Surrey, England.

199,612 Anti-rattler for hoods. G. A. Birchley, 70 Crocketts Road, Handsworth, Birmingham, and J. H. Shorthouse, 98 Old Meeting street, West Bromwich, England.

199,630 Crutch tip. G. Hipwood, 2402 Atlantic avenue, Brooklyn, and B. B. Greller, 299 Broadway—both in New York, U. S. A.

199,632 Pressure gage for tires. O. E. Richardson and H. E. Lundeen, both of Port Defiance Park, Tacoma, Washington, U. S. A.

199,669 Cushioned wheel. L. Stoll, 50 Favoritenstrasse, and "Sembusto" Elastische Radbereifungen, Ges., 130 Hutteldorferstrasse—both in Vienna.

199,694 Rubber-faced flooring and paving blocks and tiles. R. M. Ash, Pantiya Estate, Neboda, Ceylon, India.

Published August 22, 1923

199,703 Floor coverings and mats. Soc. Chimique du Caoutchouc, 1 Rue Jenri Murger, St. Denis, Seine, France.

199,769 Sectioned inner tube. T. B. McLeroth, Eastburn, The Crescent, Hadley Wood, Middlesex, England.

199,807 Puncture-proof inner tube. P. Harder, 13 Nordre Frihavnsgade, Copenhagen, Denmark.

199,920 Armored tire. W. Pickard, 36 Weston avenue, Rochdale, Lancashire, England.

199,966 Flexible gas pipe connection. E. S. Yeomans, 10 Kettering Road, Rothwell, Kettering, England.

199,971 Tire with metal studs. H. Pace, 21 Constantine Road, Hampstead, London, England.

199,994 Dust cap for tire valve. R. S. Burn. The Poplars, Wylde Green, Birmingham, England.

200,003 Compartment inner tube. A. Granat, 558 West 164th street, New York, U. S. A.

New Zealand

Published July 12, 1923

47,716 Cushion tire. D. Maggiora, of Villa "Le Fontanelle," Careggi, Florence, Italy.

Germany

Design Patents Issued with Dates of Issue

849,782 (June 2, 1923). Support for rubber hose and the like at bending point. Melchior Oertli, Werfstrasse 3, Berlin.

850,061 (January 21, 1921). Protective cover of leather or the like for elastic tires. Paul Wienskowitz, Neue Ansbacherstrasse 3, Berlin.

850,075 (June 28, 1922). Exchangeable rubber tread patch. Max Guth, Gervinusstrasse 15, Charlottenburg.

850,082 (January 29, 1923). Rubber watch bracelet. Paul Reiner, Heinrichstrasse 36, Hamborn.

850,172 (May 29, 1923). Catheter bandage. August Zinn, Schnessener Weg 27, Niendorf bei Hamburg.

850,183 (June 9, 1923). Stand for rubber heels with slanting bottom. Admiral Gummi A.-G., Düsseldorf.

850,184 (June 9, 1923). Stand for rubber heels for flat arrangement. Admiral Gummi A.-G., Düsseldorf.

850,229 (May 6, 1922). Irrigator syringe. Julius Aller, Otto Gassner and Otto Wohlschläger, Vienna; represented by Kurt Theuerkorn, Ferdinandstrasse 17, Chemnitz.

850,355 (May 22, 1923). Cover protection for automobile tires. Louis Meineke, Scheidestrasse 27, Hannover-Kleefeld.

850,462 (June 15, 1923). Exchangeable cover of rubber for head-rests of dentists' operating chairs. Arthur Kroboth, Lüneburg.

850,495 (April 16, 1923). Leather and rubber sole. Louis Bittler, Konstantinstrasse 96, Köln-Deutz.

850,551 (June 21, 1923). Cuff protector. Lenel, Bensinger & Co., Fabrik wasserdichter Wäsche, Mannheim-Neckarau.

850,771 (June 21, 1923). Tire patches. Reinhold Schwartz, Frobenstrasse 21, Berlin.

850,825 (May 1, 1923). Rubber footwear. Norddeutsche Gummi-und Guttaperchawarenfabrik vorm. Fonrobert & Reimann.

850,923 (May 15, 1923). Hollow rubber toys. Fr. G. Herrmann, Seiferitz-Meerane i. Sa.

850,929 (May 28, 1923). Foot-ball valve. Wilh. Thönissen, Barthelstrasse and M. Fekau, Eigelsteinstrasse 41, both of Cologne.

851,000 (June 19, 1923). Toy for throwing up and catching balls. Karl Sobnius, Charlottenstrasse 108, Düsseldorf.

851,093 (June 27, 1923). Attachment for rubber tread portion. Josef Richter, Carusstrasse 7, Dresden.

851,118 (March 17, 1923). Non-slip cover for operating instruments. Vereinigte Berlin-Frankfurter Gummiwaren-Fabriken, Berlin-Lichterfelde.

851,180 (July 7, 1923). Rubber heel. Albert Weiss, Staaken.

851,206 (December 6, 1922). Knee-supporting device for motor-cyclists. Hannoversche Gummiwerke Excelsior A.-G., Hannover-Limmer.

851,213 (March 23, 1923). Swimming glove. Rudolf Walter, Oggersheim.

851,239 (June 9, 1923). Flag of pure rubber. Ernst Berg, Klingelpütz 52, Cologne.

851,361 (June 8, 1923). Rubber belt for clothing. Continental-Caoutchouc und Gutta-Percha Compagnie, Hannover.

851,366 (June 8, 1923). Rubber skirt holder skin for lady cyclists. Fa. Carl Plaat, Köln-Nippes.

851,417 (June 28, 1923). Rubber coat. Eugen Nitzsche, Boxgraben 36, Aachen.

851,419 (June 29, 1923). Trumpet of rubber or of rubber in combination with other materials. Gummiwarenfabrik. M. Steinberg. Köln-Lindenthal.

851,520 (June 12, 1923). Bathing cap. Herona Deutsche Gummigesellschaft m.b.H., Berlin.

851,581 (July 2, 1923). Stick ferule of rubber. August Laqua, Oppeln, O.-S.

851,583 (July 2, 1923). Rubber shoe-lace. Bruno Meyer, Blankenburg, Harz.

851,586 (July 3, 1923). Football valve jar. Georg Hoffmann, Fichtestrasse 12, Nürnberg.

851,738 (July 3, 1923). Rubber sole. Hannoversche Gummiwerke Excelsior A.-G., Hannover-Limmer.

852,232 (March 17, 1923). Non-skid device for pneumatic tires. Karl Schroeder, Christian-Gaustrasse 34, Köln-Braunsfeld.

Germany

Patents Issued with Dates of Issue

381,124 (June 11, 1921). Pneumatic milk pump. Dr. Miguel R. del Castillo, San Sebastien, Spain; represented by A. Kuhn, Berlin S.W. 61.

381,125 (March 31, 1921). Medicinal syringe. Grünebaum & Scheuer, Berlin.

381,127 (September 14, 1922). Nasal inhaler. Georg Mehling.

381,806 (October 26, 1922). Rubber tread patch. Karl Berbig, Georgstrasse 13, Hannover.

382,070 (December 28, 1922). Writing tablet. Continental-Caoutchouc- und Gutta-Percha-Compagnie, Hannover.

382,456 (August 5, 1922). Closing for bottle with rubber stopper. Carl Kadlec, Vienna; represented by Eugen Dicke, Godesberg.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted July 3, 1923, Act of February 20, 1905

171,097 ZOFLI—golf balls and footballs. Martins Birmingham, Limited, England.

Granted August 7, 1923, Act of February 20, 1905

171,302 SHEIK—bathing caps. Rudolph F. Graigen, New York, N. Y.

171,307 PROTECTURSUIT; the letters graduated in size and the word heavily underscored; an approximately oval background outlined—rubber aprons. The Oberndorfer Co., Milwaukee, Wisconsin.

171,359 GLASEPTIC—nebulizers and syringes. Parke, Davis & Co., Detroit, Michigan.

171,383 LAGONDA—rubber tires and tubes. The National Tire & Rubber Co., East Palestine, Ohio.

171,384 TETRALIN—rubber, rubber substitutes, resins, coal, coke, artificial fuels, tanning bark. Tetralin-Cesellschaft mit Beschränkter Haftung, Berlin, Germany.

171,385 TETRALIN—rubber mats, waterproofed fabrics, slabs of rubber composition for use in making shoe soles, waterproof coverings for persons, animals and vehicles. Tetralin-Gesellschaft mit Beschränkter Haftung, Berlin, Germany.

171,414 MAGIC—rubber jar rings. Cupples Co., Manufacturers, St. Louis, Mo.

171,418 NINETY-SIX—rubber tires. The Fisk Rubber Co., Chicopee Falls, Mass.

171,419 CORDATIC—tires of rubber, caoutchouc, or its surrogates, or a mixture thereof. Hungarian Rubber Goods Factory, Limited, Budapest, Hungary.

171,420 DOSCAT—rubber tires. Doscat Tire & Rubber Corporation, Rochester, N. Y.

171,428 VELVET—piston rings, belting, hose, machinery, packing and non-metallic tires. Velvet Piston Ring Co., Detroit, Michigan.

171,450 KLAWGRIP—rubber treads. Gilles Valiquette, Montreal, Quebec, Canada.

171,468 Representation of a tire comprising comparatively narrow circumferential, chocolate-colored stripes covering portions of each of the sidewalls of the tire and spaced from the tread and edge portions thereof—tires. Empire Tire & Rubber Corp., Trenton, N. J.

171,490 INSYDE TIRE, the words being arranged one above the other, and the top stroke of the T underscoring the first word; to the right of these words is a section of inner tubing in the form of a question mark, and in small type the words: ANSWERS THE QUESTION—reliner made with plies of fabric held together with rubber. The American Automobile Accessories Co., Cincinnati, Ohio.

171,516 ADDSMILES—outer tires or coverings for tire casings. A. J. Stephens Rubber Co., Kansas City, Mo.

171,563 A pallid design having a red background crossed by blue, green, yellow and black bars—fruit jar rings. Anchor Cap & Closure Corp., Long Island City, N. Y.

171,515 The inscription LAMKE & STEMME, INC., NEW YORK, displayed in the annular space formed by two concentric circles. The inner circle surrounds the letter L printed in a single thick line and overlapping the letter S printed in double thinner lines, monogram fashion. The outer circle is inscribed into and edgewise overlaps the figure of a vertical rhomboid, and in the open top panel of the rhomboid is the outline of a laurel leaf, while in the lower panel is the representation of an upright scepter, around which is coiled a snake in the form of the letter S, the figure known as an Aesculapian staff—surgical rubber goods and druggists' sundries. Lamke & Stemme, Inc., New York, N. Y.

Granted August 7, 1923, Act of March 19, 1920, Section 1 (b)

171,650 ANTI-FRICTION, the letters graded in such a way that the largest are at the ends and the smallest in the center of the word—shoes of leather, rubber, fabric; combinations of leather and rubber; rubber and fabric; and leather, rubber and fabric—George R. Davis, Seattle, Washington.

171,657 STRAWSAVER—rubber coverings for hats. Ignatius Petruzzelli, New York, N. Y.

171,673 Representation of a crown, with the company's monogram at the top and the words CROWN OF PERFECTION at the base—brake and transmission linings. Durwyllan Co., Inc., Peterson, Delaware, and Paterson, N. J.

171,688 LOWELL, printed in large black type of broken lines—cotton duck and cotton tire fabrics in the piece. International Cotton Mills, Boston, Mass.

171,697 FIRESTONE APSLEY, printed in double-lined white letters, the words slightly curved and one above the other—rubber heels, boots, overshoes, sandals, pads, arctics and garters. Firestone-Apsley Rubber Co., Hudson, Mass.

171,698 STYLE-FULL OVER-SIZES, the words arranged in two lines within a fanciful border—women's and children's leather shoes with composition rubber heels. Anderson-Owens Shoe Co., Lynn, Mass.

171,701 IRVING, in heavy black script, the final stroke of the G underlining the entire word—rubbers and spats, shoes, etc.

171,702 PARKER, the letters so graduated that the smallest are at the ends and the largest in the middle of the word—combination and rubber heels. Parker Rubber Manufacturing Co., Boston, Mass.

Granted August 14, 1923, Act of February 20, 1905

171,731 BEAVER—nonmetallic tires. The Badger Rubber Works, Milwaukee, and Cudahy, Wisconsin.

171,745 LEGION—pneumatic rubber tire casings. H. B. Christian, Fresno, Calif.

171,770 STRIDEAWAY—shoes of combinations of leather and rubber and of fabric and rubber. Melville Shoe Corp., New York, N. Y.

Granted August 14, 1923, Act of March 19, 1920, Section 1 (b)

171,899 JACK TIRE & RUBBER CO. printed in small heavy black letters—pneumatic tires and inner tubes. Jack Tire & Rubber Co., Spokane, Washington.

171,919 The inscription R. B. HANSEN RUBBER CO., Akron, Ohio, displayed in the annular space between two concentric circles. The inner circle surrounds the words: EVERYTHING FOR THE LADIES AND BABIES, the last two words being at the center and the others curved round them—sanitary aprons, belts, shields, etc., rubber sheeting, hot water bottles, ice caps, syringe bulbs, and surgeons' gloves. Richard B. Hansen, trading as R. B. Hansen Rubber Co., Akron, Ohio.

171,928 LIVERPOOL, printed in double line white letters—cord and fabric tires. The McLean Tire & Rubber Co., East Liverpool, Ohio.

171,942 INSTANTON—caps for inflation valves. The Dill Manufacturing Co., Cleveland, Ohio.

171,960 "GRIPTITE"—rubber splices, rubber stripes, and adhesive tape. The Canfield Rubber Co., Bridgeport, Conn.

171,964 DR. TEPPER'S GUM LYKE—dental gum. Industrial Rubber Corp., Long Island City, N. Y.

172,004 The letters B R V with a double headed arrow crossing them at the center—liquid bituminous material for compounding rubber. The Barrett Co., New York, N. Y.

172,011 RESISTON—dials made of hard rubber for radio apparatus. American Hard Rubber Co., Hempstead and New York, N. Y.

172,074 Pictorial representation of a shoe within a circle with scroll-like projections at either side, at the center of a round background resembling a miniature frame, on the face of which are the words: YOUR SHOES REBUILT AT THE FACTORY—leather, rubber, and fabric, also combinations of leather and rubber, rubber and textile fabric, and leather and textile fabric shoes. Thomas Janney Co., Philadelphia, Pa.

172,115 Representation of a tire encircling the inscription THE I X L HEEL—rubber heels. The McWade Tire & Rubber Co., Garrettsville, Ohio.

172,148 FELCO—rubber tiling. Felsway Rubber Co., Boston, Mass.

Granted August 28, 1923, Act of February 20, 1905

172,213 The letters B R C crossed at the center by a double headed arrow—solid bituminous material for compounding rubber. The Barrett Co., New York, N. Y.

172,214 The letters B R H crossed at the center by a double headed arrow—liquid bituminous material for compounding rubber. The Barrett Co., New York, N. Y.

172,256 Representation of a pear with stem and leaves, and on the pear the letters A B C—shoes made of leather, rubber, fabric, and rubber and fabric combined. A. E. Brown Shoe Co., Inc., Orwigsburg, Pa.

172,260 EUREKA, large black letters very close together and curved top and bottom to make an oval shape—composition for stopping leaks in tires and for preserving rubber. Elmer A. Garten, Hinton, W. Va.

172,290 CANFIELD, in script—dress shields. The Canfield Rubber Co., Bridgeport, Conn.

172,328 ROYLAND—golf balls, Morris Golf Ball Manufacturing Co., Wimbledon, England.

172,339 COMET—golf balls. Jordan Marsh Co., Boston, Mass.

172,348 The inscription ACE on the representation of the ace of spades—combs made of hard rubber. American Hard Rubber Co., Hempstead and New York, N. Y.

172,385 Within the annular space formed by two concentric circles the word SICORIBA, enclosed by the smaller circle is a device having six prongs—six cornered richocheting hand and foot balls of rubber. Heinrich Schnezler, Schaffhausen, Switzerland.

172,443 The letter F on a shaded background suggesting a sphere with triangular projections at left and right—tires made wholly or partly of rubber, and rubber tubes therefor. The Fisk Rubber Co., Chicopee Falls, Mass.

Granted August 28, 1923, Act of March 19, 1920 Section 1 (b)

172,503 SEIBERLING—elastic vehicle tires wholly or in part of rubber, tire flaps, reliners, strap-on boots, blow-out patches, valve patches, inner tubes, and repair kits therefor. Seiberling Rubber Co., Akron, Ohio.

The United Kingdom

Published August 1, 1923

B435,537 Representation of a small child stooping over to make a doll walk; beneath this the word "QUICKSLIP"—baby knickers. Rubberized Sheeting and Specialty Co., Inc., 221 Fourth Ave., New York, N. Y., U. S. A.

438,453 XELATA—goods made of rubber and gutta percha in Class 40 exclusively. The Balata Belting & Rubber Co., Limited, 4 Sheppy Place, Minories, London, E. 1., England.

Published August 8, 1923

431,511 WIN-WAY, printed in rather faint pin-scratch lines—sport shoes with rubber soles. Joseph Herbert Fish, Highfield, Bank Road, Crumsall, Manchester, England.

436,931 Representation of a cross-section of a solid tire and on the white space at center the letters NAP—Rubber tires. The N. A. P. Pneumatic Tube Tyre Syndicate, Limited, 181 Stonhouse street, Clapham, London, S. W. 4, England.

437,071 SATIN—steam and hydraulic packing and hose included in Class 50. The Leyland & Birmingham Rubber Co., Limited, 24-30 Duke street, Aldgate, London, E. C. 3.

437,750 WELDOX—goods made of india rubber or in which india rubber predominates, all in Class 40. John Leadbitter Smith and Rene Delarageas, both of 187 Sutherland avenue, Maida Vale, London, W. 9., England.

437,839 Three conventionalized flower blossoms, arranged two above one below, indicating a triangle—rubber gloves for surgical uses. S. Murray & Co., Limited, 11 Faringdon Road, London, E. C. 1., England.

437,970 PHILLIPETS—rubber pads for attachment to soles or heels of boots and shoes. Phillips' Patents, Limited, 142-146 Old street, London, E. C. 1, England.

438,152 CRAIPEX—all goods included in Class 40. Russells (Manchester) Limited, Lands End Works, Rhodes, Manchester, Lancashire, England.

B438,277 BRA—rubber heels for boots and shoes. Millwall Rubber Co., Limited (in liquidation), White City, Harpden, Hertfordshire, England.

438,395 Representation of a palm tree, grass at its foot; a border with rounded corners surrounding the whole—all goods included in Class 40. The Palmer Tyre, Limited, 119, 121, 123 Shaftesbury avenue, London, W. C. 2.

438,519 MONARCH—canvas fire hose. Stanley Gosman & Co., Limited, 281 Tooley street, London, S. E. 1., England.

Published August 29, 1923

435,121 Representation of an ace of spades, with the inscription ACE on its face—combs for the hair. American Hard Rubber Co., 11 Mercer street, New York, N. Y.

437,867 RUBBERIT—a binding material for use in roadmaking and the like, included in Class 17. John Frederick Wake, 123 Victoria road, Darlington, Durham.

438,423 EXPRESS—rubber plates or pads to be attached to soles or heels of boots and shoes. Phillips' Patents, Limited, 142-146 Old street, London, E. C. 1, England.

The Dominion of Canada

Registered

33,880 AIRCORE—bicycle and automobile tires and tire tubes. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.

33,935 AIROTANK—pneumatic tires, inner tubes and swimming belts. Ora Krichbaum, trading as K. & W. Rubber Co., Delaware, Ohio, U. S. A.

33,945 The words KELLY KATS associated with the representation of two cats and the words: THE TIRES WITH NINE LIVES—tires made wholly or in part of rubber. Kelly-Springfield Tire Co., New York, N. Y., U. S. A.

34,030 AEROCORE—bicycle and automobile tires and tire tubes. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.

New Zealand

Published June 28, 1923

18,029 ECLIPSE—water beds, water pillows, hot water bottles, air-cushions, etc., all being goods of rubber or gutta percha exclusively in Class 40. J. G. Ingram & Son, Limited, The London India Rubber Works, Felstead Street, Hackney Wick, London, England.

Published July 12, 1923

20,149 On a shaded background the word PARAFLOR, the final stroke of the R being flourished back above the word to join the top stroke of the initial P; beneath this word the words: RUBBER CARPETING, and beneath these a balanced scale in a small white circular space and the words TRADE MARK; within the space provided by parallel lines forming a six-sided border is the inscription; THE NORTH BRITISH RUBBER COMPANY, LIMITED, CASTLE MILLS, EDINBURGH—floorcloth and the like, made wholly or partly of rubber. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.

Designs

The United States

Issued* July 31, 1923

62,791 Ornamental design for elastic woven fabric. Term 14 years. George C. Moore and Thomas F. Moore, both of Westerly, Rhode Island.

62,809 Doll. Term 14 years. Domenic Zappia, Cleveland, Ohio, assignor to Paramount Rubber, Consolidated, Inc., Little Falls, N. J.

Issued* August 7, 1923

62,846 Tire. Term 14 years. Charles W. McKone, assignor to McKone Tire & Rubber Co., both of Millersburg, Ohio.

62,853 Tire. Term 7 years. Alfred K. Simmons, assignor of 35/100ths to Gus N. Boosalis, and 15/100ths to Lucius A. Smith, all of Faribault, Minnesota.

62,854 Same as for 62,853.

62,855 Same as for 62,853.

62,856 Same as for 62,853.

Issued* August 21, 1923

62,902 Tire. Term 14 years. George F. Englert, assignor of one-half to Charles A. Englert, both of Pittsburgh, Pennsylvania.

62,931 Tire. Term 14 years. John G. Wolfe, Chicago, Illinois.

Issued* August 28, 1923

62,936 Tire tread. Term 14 years. Percy B. Bosworth, assignor to The Victor Rubber Co., both of Springfield, Illinois.

62,952 Tire tread. Term 14 years. LeRoy P. Holloway, assignor to The American Rubber & Tire Co., both of Akron, Ohio.

62,846 62,853 62,854 62,855 62,856 62,902 62,931 62,936 62,952 62,967 62,968 62,969 62,970 62,971 62,972

62,967 Tire. Term 3½ years. James B. Topham, Zelienople, Pennsylvania.

62,968 Same as for 62,967.

62,969 Same as for 62,967.

62,970 Same as for 62,967.

62,971 Tire. Term 3½ years. Elmo H. Trump, assignor to The Lambert Tire & Rubber Co., both of Barberton, Ohio.

62,972 Tire. Term 14 years. William S. Wolfe, Akron, Ohio.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

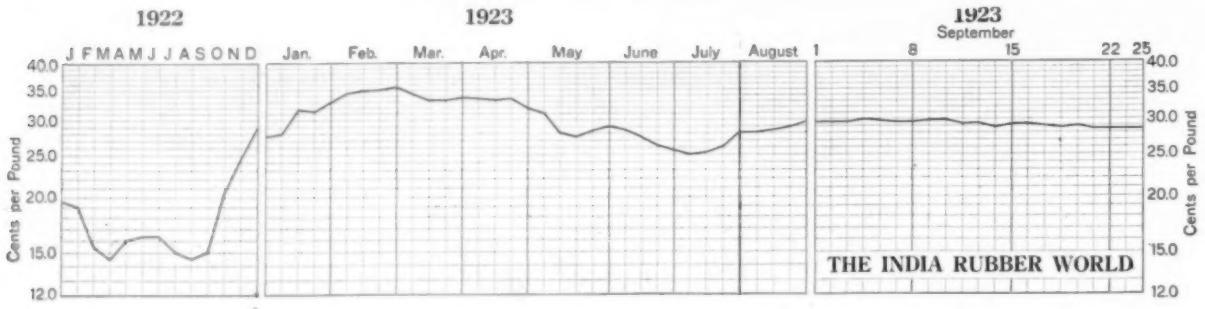
Registered

5,862 Tire tread. Bawden Machine Co., Limited, Toronto, Ontario.

5,894 Tire tread. The Kaufman Rubber Co., Limited, Kitchener, Ontario.

5,895 Same as for 5,894.

5,896 Same as for 5,894.



Ratio Graph of New York Market Fluctuations—Average Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE maximum price of 30 cents, or slightly better, which was attained about August 27, did not hold beyond September 3. Although the market was steady and strong during that interval very little business was done. Following Labor Day a decline began which has since persisted, with marked dullness and lack of buying interest. September 8 the spot price was 29½ cents after a disappointing week. Consuming demand was absent except some scattered buying and price inquiries.

The second week of the month opened firm at 29¾ cents. Very little rubber was offered at any time during the week and London prices were higher than those in New York. The week closed with spot at 29¼ cents. Inclination of smaller factories to purchase was checked by reason of their expectation of lower prices to follow.

The third week showed continued dullness with slightly downward tendency in the spot price, which closed the week at 28⅞ cents. Factories were buying only cheap lots offered by weak sellers. Most interest was shown in November-December, January-March and January-June positions. Sales were made for January-March at 29½ cents. At the close of the month the spot rubber was 29 cents with a few dealers shading these figures. Factories were still waiting for lower prices and not bidding.

Parás and all other grades, including balatas, ruled dull and quiet in sympathy and were generally neglected throughout the month.

Imports of all grades during August, 1923, were 18,674 tons, compared with 21,764 tons one year ago. Plantation arrivals for August, 1923, were 18,083 tons, compared with 20,462 tons one year ago. Total importations of all grades for the eight months ended August 31, were 227,322½ tons, compared with 177,367 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. September 1. Spot first latex crêpe, 29⅜-29¾ cents; September, 29¾ cents; Oct.-Dec., 30¼-30⅝ cents; Jan.-Mar., 30¾-31.

September 25. Spot first latex crêpe, 28¾ cents; Sept.-Oct., 28¾ cents; Nov.-Dec., 29 cents; Jan.-Mar., 29¾ cents.

September 1. Spot ribbed smoked sheets, 29⅜-29¾ cents; September, 29¾ cents; Oct.-Dec., 30¼-30⅝ cents; Jan.-Mar., 30¾-31 cents.

September 25. Spot ribbed smoked sheets, 28½-28¾ cents; Sept.-Oct., 28½ cents; Nov.-Dec., 28¾ cents; Jan.-Mar., 29⅜ cents.

September 1. Spot No. 1 amber crêpe, 29-29½ cents; September, 29¾ cents; Oct.-Dec., 29¾-30½ cents; Jan.-Mar., 30-30¾ cents.

September 25. Spot No. 1 amber crêpe, 28 cents; Sept.-Oct., 28 cents; Nov.-Dec., 28¼-28½ cents.

September 1. Spot No. 1 rolled brown crêpe, 27¾-28 cents; September, 28¼-28½ cents; Oct.-Dec., 28½-28¾ cents.

September 25. Spot No. 1 rolled brown crêpe, 26¾ cents; Sept.-Oct., 26¾ cents; Nov.-Dec., 26⅞ cents.

SOUTH AMERICAN PARAS AND CAUCHO, September 1. Spot, upriver, fine, 28 cents; islands fine, 25 cents; upriver coarse, 23½ cents; Cametá, 14½ cents; caucho ball, 25 cents.

September 25. Spot, upriver fine, 26½ cents; islands fine, 25 cents; upriver coarse, 22 cents; Cametá, 13½ cents; caucho ball, 21-23 cents.

London

The London market in September opened with spot ribbed smoked sheets steady and strong at 15⅞*d.* The first three weeks of the month showed similar dullness and slow reduction of the spot price week after week; the closing prices for each week being as follows: September 8, 15¾*d.*; September 15, 15⅜*d.*, and September 22, 15¼*d.*

Reported London spot stocks have shown a steady increase week by week. The record is as follows: August 27, 47,600 tons; September 3, 48,659 tons; September 10, 49,801 tons; September 17, 51,540 tons.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and September 25, the current date:

Plantation Hevea

	September 25, 1922	August 25, 1923	September 25, 1923
LATEX			
Rubber latex (Hevea)	@	$1.25@1.30	$1.25@1.30
CREPE			
First latex	.14¼@	.29¼@	.28¼@.29
Off latex	.14¼@	.29½@	.28½@
Amber No. 1	.14⅜@	.29 @	.28 @.28¼
Amber No. 2	.14¼@	.28½@	.27 @.27¼
Amber No. 3	.14 @	.28 @	.26½@
Brown, clean, thin	.13¾@	.28 @	.27 @.27¼
Brown, specky	.12¾@	.27¼@	.26½@.26¾
Brown, rolled	.11¾@	.27¼@	.26½@.26¾
SHEET			
Smoked, ribbed	.14⅝@	.29¼@	.28½@.28¾
Smoked, plain	@	@	†.27¾@.28
Unsmoked	@	@	†.26½@.27

Crude Rubber Market—*Continued*

	September 25, 1922	August 25, 1923	September 25, 1923
SCRAP			
Colombo scrap No. 1..	.11¼ @	.23 @.25	.23 @.22
Colombo scrap No. 2..	.10 @	@	.22 @.23
East Indian			
PONTIANAK			
Banjermassin	.07½ @	.07½ @	.07 @.07¼
Palembang	@	.08 @	.07½ @
Pressed block	.11½ @	.12½ @	.11¾ @.12
Sarawak	.06¾ @	.07 @	.07 @
South American			
PARAS			
Upriver, fine	.18⅞ @.19	.28¾ @	.26½ @.27
Upriver, fine	*.26 @	*.36¾ @	*.36½ @
Upriver, medium	.17 @.17½	†.27 @	.24½ @
Upriver, coarse	.13¾ @	.23¾ @	.22 @.22½
Upriver, coarse	@	*.34½ @	*.33½ @
Islands, fine	.16¾ @.17	†.27 @	.25 @.25½
Islands, medium	.15 @.15½	@	.23¾ @
Islands, coarse	.09 @.09½	.23¾ @	.13 @
Cametá	.09 @.09½	.15 @	.13½ @.13¾
Acre Bolivian, fine	.19 @	.29 @	.26 @.26½
Acre Bolivian, fine	*.26 @	*.37 @	*.36 @
Beni Bolivian	.19¼ @.19½	.29½ @	.27½ @.27¾
Madeira, fine	.19½ @.20	†.30 @	.28 @.28½
Peruvian, fine	.17¾ @	†.26½ @	.27 @
Tapajos, fine	.18 @	.27½ @	.26 @.26½
CAUCHO			
Upper caucho ball	.13½ @.13¾	.24 @.24½	.23 @.23¼
Upper caucho ball	*.18½ @	*.34½ @	*.33¼ @
Lower caucho ball	.11½ @.12	.22½ @	.21 @.22
Maniçobas			
Ceará negro heads	.08 @	@	.22 @
Ceará scrap	.05 @	@	.09 @
Maniçoba 30% guaranty	.07 @	@	.18 @
Mangabeira, thin sheet	.12 @	@	.22 @
Centrals			
Central scrap	.10 @.12	.17 @.17½	.16¾ @.17
Central wet sheet	.06 @.08	.10 @.12	.14 @.16
Corinto scrap	.10 @.12	.17 @.17½	.16¾ @.17
Esmeralda sausage	.10 @.12	.17 @.17½	.16¾ @.17
Guayule washed & dried	.26 @	.27 @	.28 @
Africans			
Benguela, No. 1, 28½%	.07 @	@	@
Benguela, No. 2, 32½%	.05½ @	.15 @	.14 @.16
Congo prime, black upper	.08 @	@	.23 @
Congo prime, red upper	.11 @	@	.21 @.22
Kassai, black	.08 @	.22 @.23	.23 @
red	.11 @	.20 @.21	.20 @.21
Gutta Percha			
Gutta Siak	.15 @	.60 @.61	.16 @
Gutta Soh	@	.23½ @	.16 @.24
Red Macassar	2.80 @	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	.54½ @.55	.71 @	.73 @.74
Colombia	.45 @	.60 @.61	.60 @
Panama	.45 @	.60 @.61	.60 @
Surinam, sheet	.67 @.68	.80 @	.78 @
amber	.72 @.73	.85 @.86	.83 @
Chicle			
Colombia	.19 @.25	.25 @	.25 @
Honduras	.63 @.64	.62 @	.62 @
Venezuela	.65 @	.63 @	.63 @
Yucatan, fine	.68 @	.65 @	.65 @

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

Comparative Low and High New York Spot Rubber Prices

	September 1923*	September 1922	September 1921
PLANTATIONS			
First latex crêpe	$0.28½ @ $0.30½	$0.13¾ @ $0.15	$0.14 @ $0.16
Smoked sheet, ribbed	.28½ @ .30¼	.13⅜ @ .14⅞	.13¾ @ .15¾
PARÁS			
Upriver, fine	.26½ @ .28½	.18½ @ .19	.17½ @ .21½
Upriver, coarse	.22 @ .24½	.13½ @ .14	.09½ @ .11½
Islands, fine	.25 @ .26½	.17 @ .17¼	.16½ @ .19
Islands, coarse	.13 @ .14¾	.08½ @ .09½	.07 @ .09½
Cametá	13½ @ .15¼	.08¾ @ .09½	.07½ @ .09¼

*Figured to September 25, 1923.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of September 7, 1923:

During the first part of the week the market was firm, though quiet, then the market was closed during two days and today the tone was weak, prices declining about 2 cents.

The close is dull at the lowest prices, viz.:

Hevea crêpe and sheets Fl.	$0.82	Spot.
Hevea crêpe and sheets Fl.	.84½	October to December.
Hevea crêpe and sheets Fl.	.86	January to March.

Reclaimed Rubber

Rubber manufacturers' needs, as regard reclaims, continue moderate. Purchases are made strictly for current and nearby requirements only, hence reclaims are experiencing a season of extremely keen competition in placing output. There are large surplus stocks, due to overproduction. Values were never greater either in volume cost or compounding quality.

Current prices remain unchanged from those quoted one month ago.

New York Quotations

September 25, 1923

Prices subject to change without notice

Reclaimed Stocks

FRICTION		
Compounded	lb.	$0.19 @ $0.20
Pure gum friction	lb.	.22¼ @ .24
TUBE		
Compounded	lb.	.12¾ @ .13¼
Floating	lb.	.16 @ .16½
AUTO TIRE		
Black	lb.	.09½ @ .09¾
Gray	lb.	.11 @ .11½
White	lb.	.13¼ @ .13½
Black, washed	lb.	.11 @ .11¼
SHOE		
Unwashed	lb.	.10½ @ .11
Washed	lb.	.13¼ @ .13½
MISCELLANEOUS		
Mechanical, black	lb.	.10 @ .11
High grade red	lb.	.13½ @ .14
Truck tire	lb.	.08¾ @ .08

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS:	August, 1923																							Sept., 1923
Sheet	6	7	8	9	10*	11*	13	14	15	16	17	18	20	21	22	23	24	25	27	28	29	30	31	1
Ribbed smoked	27⅞	28¼	28⅞	28½	....	....	28⅞	28⅝	28⅜	28⅛	28¼	28¼	28⅜	29⅛	29½	29½	29½	29½	29¾	30⅛	29⅞	29⅜	29⅞	29⅞
Crêpe																								
First latex	28	28¼	29	28⅝	....	....	29	28⅝	28½	28¼	28⅛	28⅜	28½	29¼	29⅝	29¾	29⅝	29⅝	30	30⅛	30	29⅜	30	30
Off latex	27⅛	28⅛	28⅜	28	....	....	28½	28¼	28	27⅝	27⅝	27⅝	28½	28½	28⅞	29	29	29	29⅛	29⅜	29⅛	28¾	29⅜	29⅜
No. 1 blanket	27⅛	27⅞	28⅛	27⅞	....	....	28⅜	27⅞	27½	27⅜	27½	27⅜	27½	28	28⅜	28½	28⅜	28⅛	28½	29¼	29⅛	29	29⅛	29⅛
No. 2 blanket	26⅝	27½	27¾	27½	....	....	27⅝	27½	27	27	27	27	27⅛	27⅜	28⅛	28	27⅞	27⅞	28⅛	28¾	28⅛	28⅜	28⅝	28⅝
No. 3 blanket	26⅛	26⅝	27¼	27	....	....	27⅛	27	26⅝	26½	26⅝	26½	26¾	26⅞	27⅝	27⅝	27½	27½	27⅝	28¼	27¾	27⅝	27⅞	27⅞
Thin, clean, brown	26½	27½	27⅞	27⅝	....	....	27⅞	27⅝	27⅛	27⅛	27½	27½	27¼	27¾	28½	28	28	28	28¼	28⅝	28½	28⅛	28⅜	28⅜
Specky brown	26	26¾	27½	27	....	....	27⅛	27	26⅝	26⅝	26½	26⅝	26⅝	27½	27⅝	27¼	27⅜	27⅜	27⅝	27⅞	27⅝	27⅜	27⅝	27⅝
Rolled brown	25⅞	26⅛	26¾	26⅝	....	....	26¾	26½	26½	26⅛	26	26	26¼	26⅛	27¼	27⅛	26⅞	26⅞	27¼	28⅛	27⅝	27⅛	27⅝	27⅝

* No market (Pres. Harding's funeral).

The Barometer

This shows in the simplest way the main factors which affect the condition of the market and control the price of the commodity. (†Estimated.)

		Plantation Shipments Tons	World's Shipments Tons	Plantation Rubber (per pound) Highest s. d.	Lowest s. d.	United States Retained Tons	Great Britain Retained Tons	Great Britain Stock Tons
January,	1923	31,797	34,397	1/ 6½	1/ 2¾	34,725	2,397	82,144
	1922	26,041	29,171	0/11¼	0/ 8¾	23,588	—1,977	73,539
	1921	20,707	23,067	1/ 3½	0/11½	11,494	9,396	62,279
February,	1923	33,682	36,022	1/ 6	1/ 5½	26,088	—24	78,253
	1922	27,781	29,701	0/ 9	0/ 7¾	29,440	—2,101	76,337
	1921	19,121	21,511	1/ 2¼	1/ 0¾	9,468	6,316	65,792
March,	1923	38,362	40,972	1/ 5¾	1/ 4½	29,816	133	70,649
	1922	25,398	27,683	0/ 8¼	0/ 7½	28,011	647	75,332
	1921	19,711	21,526	1/ 0¾	0/11½	12,449	6,955	70,918
April,	1923	34,610	37,390	1/ 4¾	1/ 3¼	30,297	—4,452	65,491
	1922	20,354	24,349	0/ 8¼	0/ 8	18,948	2,354	77,142
	1921	21,028	23,110	0/11½	0/10¼	10,887	6,950	76,318
May,	1923	29,978	32,238	1/ 3¼	1/ 1¼	32,000†	—5,008	60,918
	1922	35,912	37,633	0/ 8½	0/ 7¼	15,677	2,868	79,148
	1921	21,877	23,367	0/10¼	0/ 8¼	10,251	6,075	78,833
June,	1923	28,000†	29,935†	1/ 3	1/ 1½	33,000†	—1,894	55,432
	1922	27,202	28,982	0/ 8¾	0/ 7¼	22,543	2,266	80,658
	1921	21,992	24,262	0/ 9	0/ 8	15,129	4,064	78,465
July,	1923	28,000†	29,631†	1/ 3	1/ 1½	18,000†	603	54,280
	1922	30,897	32,377	0/ 8¼	0/ 7¼	25,351	1,620	80,412
	1921	20,450	21,855	0/10	0/ 8¾	11,964	3,724	80,702
August,	1923	....	....	....	....	....	....	....
	1922	30,674	32,438	0/ 7½	0/ 6¾	23,973	1,919	80,259
	1921	25,703	27,078	0/ 9¼	0/ 8	14,332	186	82,844
September,	1923	....	....	....	....	....	....	....
	1922	29,522	30,957	0/ 8¼	0/ 6¾	19,423	—107	79,124
	1921	27,343	28,502	0/ 9½	0/ 8¼	14,819	—817	82,077
October,	1923	....	....	....	....	....	....	....
	1922	40,282	42,392	1/ 0¼	0/ 8½	32,959	—840	76,763
	1921	22,983	24,978	0/10¼	0/ 8½	20,635	—719	79,373
November,	1923	....	....	....	....	....	....	....
	1922	32,326	34,746	1/ 2	0/11½	23,706	1,169	76,757
	1921	26,460	28,585	0/11¼	0/ 9¾	22,629	—820	81,091
December,	1923	....	....	....	....	....	....	....
	1922	28,951	31,171	1/ 2½	1/ 1¾	32,647	....	81,081
	1921	25,858	28,118	0/11¾	0/10¾	25,590	806	79,661
To End July	1923	225,451	241,607	1/ 6½	1/ 1¼	206,749	—8,245	....
Estimated,	1923	380,000	410,000	....	....	340,000	....	....
For year	1922	354,980	379,920	1/ 2½	0/ 6¾	296,267	11,164	81,081
For year	1921	271,233	293,960	1/ 3½	0/ 8	179,647	42,116	79,661
For year	1920	304,816	343,731	2/10¼	0/10	248,791	56,972	56,499
For year	1919	340,225	381,860	2/11	1/ 8	236,977	42,520	24,986
For year	1918	200,950	241,579	2/ 6¾	2/ 1	142,872	30,104	16,134

Compiled by W. H. Rickinson & Sons, London, England.

British Malaya Rubber Exports

An official report from Singapore states that the gross exports of rubber from British Malaya in the month of August, 1923, amounted to 19,806 tons (44,365,900 pounds); the amount of rubber imported was 7,042 tons (15,773,100 pounds); so that net exports amounted to 12,764 tons, as compared with 18,575 tons in the corresponding month of 1922.

Appended are the comparative statistics:

	1922 Gross Exports Tons	1922 Net Exports Tons	1923 Gross Exports Tons	1923 Net Exports Tons
January	18,962	16,027	22,871	18,513
February	20,033	18,426	19,907	15,818
March	19,304	17,812	23,646	18,538
April	14,400	12,539	24,008	18,619
May	24,789	22,095	20,115	15,095
June	19,617	17,330	18,621	13,664
July	21,964	18,822	16,749	11,125
August	21,316	18,575	19,806	12,764
Totals	160,385	141,626	165,723	124,136

The Market for Rubber Scrap

New York

Conditions in the rubber scrap market during the past month have not changed essentially from those noted a month ago. The reclaiming industry is not actively seeking supplies of scrap, and prices continue to rule very low and unchanged since last month. There was a slight tendency for the price on boots and shoes to stiffen fractionally.

BOOTS AND SHOES. Dealers' bids have been fairly steady at $3.12½ per 100 pounds with reclaimers not inclined to accept an advance.

TIRES. Mixed auto tires are obtainable at $14 to $16 per ton.

INNER TUBES. Prices for both No. 1 and No. 2 grades hold firm, dealers bidding $4.50 for No. 1 and for No. 2 $3.50 per 100 pounds delivered.

SOLID TIRES. There is some demand for cleaned solid tires at $30 delivered as rock bottom price.

AIR-BRAKE HOSE. The market is dull and prices nominal.

MECHANICALS. There continues to be no market for this grade.

Quotations for Carload Lots Delivered

September 25, 1923

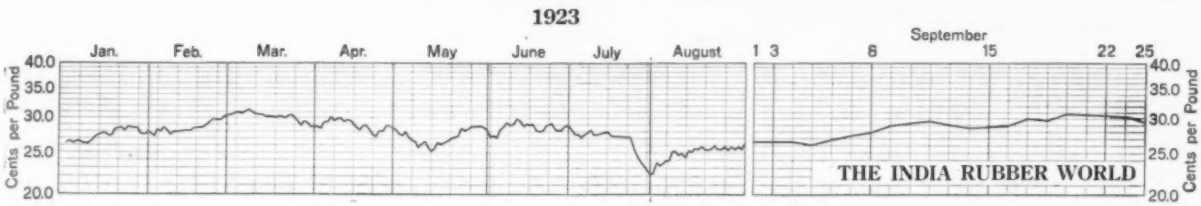
Prices subject to change without notice

Boots and Shoes				
Boots and shoes, black	lb.	$0.03⅛	@	.03¼
Trimmed arctics	lb.	.02¼	@	.02⅜
Untrimmed arctics	lb.	.01¾	@	.01⅞
Hard Rubber				
Battery jars, black compound	lb.	.02	@	.02½
No. 1 scrap	lb.	.09	@	.10
Inner Tubes				
No. 1	lb.	.04½	@	.04⅝
No. 2 red	lb.	.03¼	@	.03½
Mechanicals				
Black scrap, mixed	lb.	.01¾	@	
Heels	lb.	.00½	@	.00⅞
Horse-shoe pads	lb.	.02¾	@	.03⅛
Hose, air brake	lb.	.00¾	@	.01
regular	lb.	.00½	@	.00¾
Red, scrap, mixed	lb.	.01¾	@	.02⅛
White scrap, mixed	lb.	.01¾	@	.02⅛
Tires				
PNEUMATIC				
Auto peelings	lb.	.01½	@	.01⅝
Bicycle	lb.	.00⅞	@	
Standard white auto	ton	27.50	@	37.50
Mixed auto	ton	14.00	@	16.00
Stripped, unguaranteed	ton	10.00	@	12.50
SOLID				
Carriage	ton	25.00	@	30.00
Irony	ton	10.00	@	15.00
Truck, clean	ton	25.00	@	30.00

Crude Rubber Exports from Java, Madura, and Sumatra

To—	June 1922 Java* Madura	June 1922 East Coast Sumatra	June 1922 Total	June 1923 Java Madura	June 1923 East Coast Sumatra	June 1923 Total	Six Months Ended June 1922 Java Madura	Six Months Ended June 1922 East Coast Sumatra	Six Months Ended June 1922 Total	Six Months Ended June 1923 Java Madura	Six Months Ended June 1923 East Coast Sumatra	Six Months Ended June 1923 Total Tons*
The Netherlands	234	132	366	214	79	293	2,160	1,379	3,539	1,477	1,147	2,624
England	678	184	862	340	307	647	3,063	925	3,988	2,485	1,236	3,721
Germany	62	42	104	22	9	31	410	378	788	121	100	221
France	23	...	23	25	28	53	106	35	141	265	50	315
Italy	15	20	35	21	54	75	40	21	61	147	124	271
Belgium	...	...	...	...	28	28	...	40	40	...	65	65
America	2,017	1,505	3,522	1,909	1,700	3,609	7,587	11,802	19,389	11,893	13,555	25,448
Canada	...	...	...	...	...	...	...	...	...	16	...	16
Malaya	172	403	575	261	723	984	1,527	3,294	4,821	874	4,526	5,400
Japan	...	...	...	94	...	94	69	...	69	134	...	134
Australia	...	122	122	24	...	24	93	503	596	106	...	106
Elsewhere	...	...	...	...	1	1	11	30	41	...	12	12
Total, tons*	3,201	2,408	5,609	2,910	2,929	5,839	15,066	18,407	33,473	17,518	20,815	38,333

*Metric tons equal to 2,204 pounds.



Ratio Graph of New York Market Fluctuations—Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The spot cotton market has fluctuated erratically upward during the past month, from 25.35 cents on August 25, to 30.75 cents September 20, from which level it receded to 30.1 September 24. The reasons for this upward advance are the effects of poor growing conditions and the ravages of the boll weevil, emphasized by the government crop report estimates, which indicate lessening chances for an adequate crop. The yield is variously estimated at from 10,000,000 to 11,000,000 bales and it is agreed on all sides that this quantity will be less than needed.

EGYPTIAN COTTON. Although there has been recently some buying of staples, this business has now stopped, owing to the sharp advance in prices. Medium Uppers have reached 34 cents and Sakels are less active at about three cents higher. There has been a considerable increase in the area planted to Uppers this year and the estimated yield of this growth is from 3,000,000 to 3,250,000 cantars against 2,000,000 last season. This increase has been largely at the expense of Sakel, of which the crop will probably be about 2,500,000 cantars.

ARIZONA COTTON. Pima cotton is coming in slowly, but it is expected that there will be very little No. 1 to match the new government standard. The total crop will probably not much exceed 20,000 bales, as Arizona has planted a great deal of short cotton this year. No. 2 is quoted at about 35 cents.

SEA ISLANDS. This year's growth has not appeared on the market. There are a few thousand bales from past seasons. Recently extra choice could be bought at 38 cents.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The present market situation is a very tense one, with cotton goods substantially below a parity with cost of production plus a profit. The cost comprises mainly the cost of cotton. With spot cotton virtually within a cent a pound of the high of last season, reached in March, prices of fabrics are 7 to 10 cents below the price at the same period.

Fabrics are advancing, but not as rapidly as raw cotton, leaving the disparity substantially maintained. This situation will correct itself, requiring a steadier cotton market and two to three months' time for the accomplishment. Steadily advancing fabric market is probable until next spring, with prices higher than during the 1922 cotton season.

The market is a tense, complex and difficult one at present.

SHEETINGS. The market is very strong, with a tendency to advance further. There has been a good volume of buying during several weeks past, buyers covering their needs for from 60 to 90 days. They have become very cautious within a brief time, probably due to the very high prices prevailing at present.

TIRE FABRICS. Tire manufacturers seem to have been well stocked with tire fabric and at present are buying very little. Their ideas of price are below actual mill costs. The situation is leading fabric mills to turn their machinery to other products that will show a profit. The days of square woven fabric seem to be numbered, and the popularity of cord fabric as commonly made is threatened by newer methods of cord fabric-making whereby weaving costs are eliminated.

New York Quotations

September 25, 1923
Prices subject to change without notice

Drills

38-inch 2.00-yard	*yard*	$0.25½@
40-inch 3.47-yard		.14¾@
52-inch 1.90-yard		.27⅜@
60-inch 1.52-yard		.34¼@

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	*yard*	.26½@
40-inch 1.47-yard		.35⅛@
72-inch 16.66-ounce		.56 @
72-inch 17.21-ounce		.60½@

MECHANICAL

Hose	*pound*	.50 @
Belting		.49 @

TENNIS

51-inch 1.35-yard	*yard*	.40 @

Osnaburgs

40-inch 2.35-yard	*yard*	.22⅛@
40-inch 2.48-yard		.21 @
40-inch 3.00-yard		.17⅛@
37½-inch 2.42-yard		.27½@

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	@
Bombazine 60 x 48		@
Cashmeres 36-inch, tan	.50	@
Plaids 60 x 48		@
Plaids 56 x 44		@
Surface prints 60 x 48		@
Surface prints 64 x 60		@

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.18¼@
48 x 48, 2.85-yard		.16¼@
64 x 68, 3.15-yard		.16½@
56 x 60, 3.60-yard		.13¾@
48 x 44, 3.75-yard		.12¾@

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.10½@
40 x 40, 6.15-yard		.08½@
40 x 40, 6.25-yard		.08 @

Silks

Canton, 38-inch	*yard*	$0.37½@
Sateens, 39-inch	*lb.*	.28½@

Tire Fabrics

BUILDING

17¼-ounce Sakellaridis, combed	*pound*	@
17¼-ounce Egyptian, combed		@
17¼-ounce Egyptian, carded	.62	@
17¼-ounce Peeler, carded	.59	@

CORD

15-ounce Egyptian, combed	*pound*	@
15-ounce Egyptian, carded	.65	@
15-ounce Peeler, carded	.62	@

BREAKER

Leno, Peeler, carded	.59	@

CHAFER

9¼-ounce Egyptian, carded	*pound*	.66 @
9¼-ounce Peeler, carded		.64 @

The Market for Chemicals and Compounding Ingredients

New York

TRADE in rubber chemicals and compounding ingredients has shown signs of improvement during the past month due to restocking of supplies by rubber manufacturers in anticipation of fall activity in common with other users of chemicals and pigments.

ANILINE. Spot stocks are not excessive, prices are firm and demand steady and in good volume.

ASBESTINE. This standard compounding material for mechanical rubber goods continues in good spot supply and steady seasonal request.

BARYTES. The output of barytes has greatly increased in volume, due to its use by makers of lithopone. Rail shipping conditions have improved over a year ago and the active demand is being well met by producers.

BENZOL. Production was curtailed in August. There is a good movement of material on contracts, and stocks on hand are ample to meet the requirements of the consuming trade for a considerable period even though production were reduced much more than it has been.

BLANC FIXE. Conditions in the blanc fixe market are similar to those in that of barytes. There is good seasonal movement in progress.

CARBON BLACK. The spot supply is good and in line with the contract market. Consumption continues heavy and there is steady interest to secure black for export. New carbon black plants are reported projected in the Southwest, promising that the production next year is to be much greater than this year.

CHINA CLAY. China clay for rubber compounding is gaining in popularity on its merits as a toughener and abrasive wear resistant. The summer seasonal movement was not felt as a marked reduction below previous normal. Resumption of fall tire manufacturing schedules will probably tax the capacity of makers of special grade clays for rubber work.

DRY COLORS. Dry colors are now recovering from the slack summer trade, which is resuming normal proportions.

LITHARGE. Consumers are buying only for current needs resulting in only a fair volume of trade.

LITHOPONE. The year's output of lithopone will be a record one. Rubber makers have not been taking their normal large proportion for some time owing to seasonal conditions.

SOLVENT NAPHTHA. This material seems to be habitually short supply. It is selling mostly on contract at firm prices.

SULPHUR. The market is following its usual steady routine course and there is abundant supply.

TALC. Both domestic and imported grades are active.

WHITING. Stocks and prices show essentially no change. Trade is in good seasonal volume.

ZINC OXIDE. Early in the month the tire makers were not actively buying but have since showed renewed interest as the time for tire production on increased schedules approaches.

New York Quotations

September 25, 1923

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¼	@
Lead, red	lb.	.10 9/10	@
sublimed blue	lb.	.08¾	@
sublimed white	lb.	.08¾	@
Lime, flour	lb.	.02	@ $0.02½
R. M. hydrated	ton	10.00	@
superfine	lb.	.02	@
Litharge, domestic	lb.	.10½	@ *.10½
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.07¾	@ .08¾
calcined, light (bbls.)	lb.	.23	@ .24
calcined, ex. light (bbls.)	lb.	.40	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.04½	@ .06
Orange mineral A.A.A.	lb.	.13 9/10	@
Rubber lead	lb.	.10	@
Sulzin, ton lots	lb.		@
less ton lots	lb.		@

Accelerators, Organic

A-7	lb.	.75	@ .85
A-19	lb.	.85	@ .95
Accelemal	lb.	.35	@
Accelerene (f. o. b. English port)	lb.	13s.	@
Aldehyde ammonia powder	lb.	.95	@
Aniline (f. o. b.) factory	lb.	.16½	@ .18
sulphate	lb.	.33	@ .35
Cryline	lb.	.60	@
Diphenyl diamino carbazol	lb.	.36	@
Diphenylguanidine	lb.	1.20	@
Ethylidene aniline	lb.	.70	@ .75
Excellerex	lb.	.40	@ .45
Formaldehyde aniline	lb.	.47½	@
H. R.	lb.	1.40	@ 1.50
Hexamethylene tetramine	lb.	.85	@
Lead oleate (bbls.)	lb.	.16	@
Methylene aniline	lb.	.38	@ .42
No. 999	lb.	.16	@
Paraldehyde	lb.	.17	@ .19
Para-nitros-dimethyl aniline	lb.	.25	@
Paraphenylene diamine	lb.	1.40	@ 1.45
Quinodine	lb.	.65	@
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .35
Super-X	lb.	.30	@
Tuads (Tetramethyl thiuram-disulphide)	lb.	6.00	@
Thiocarbanilide	lb.	.26	@ .35
Triphenylguanidine	lb.	1.00	@
Vul-Ko-Cene	lb.	.35	@

*Nominal.

Acids

Acetic 28% (bbls.)	lb.	$0.03¾	@ $0.04½
glacial (Carboys)	lb.	.18	@
Cresylic (95% straw color)	gal.	.78	@
(95 dark)	gal.	.95	@ 1.10
Sulphuric, 66 degrees	lb.	.01¾	@

Alkalies

Caustic soda	cwt.	3.10	@
flake, 76% (factory)	cwt.	3.50	@
solid, 76% (factory)	cwt.	3.15	@

Colors

BLACK

Bone, powdered	lb.	.05½	@ .07½
Carbon black	lb.	.12	@ .22
pressed	lb.	.13	@ .17
Drop	lb.	.07½	@ .10
Gritless black	lb.	.40	@
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.11	@ .20
Micronex	lb.	.13	@ .17
Shawinigan	lb.	.17	@ .18

BLUE

Cobalt	lb.	.21	@ .26
Gritless blue	lb.	3.50	@
Prussian	lb.	.50	@
Ultramarine	lb.	.25	@

BROWN

Iron oxide	lb.	.04½	@ .05½
Sienna, Italian	lb.	.06½	@ .07½
Umber, Turkey	lb.	.06½	@ .07

GREEN

Chrome, light	lb.	.30	@ .32
medium	lb.	.32	@ .34
dark	lb.	.34	@ .42
commercial	lb.	.12	@
tile	lb.	.13	@ .15
Gritless green	lb.	3.50	@
Oxide of chromium	lb.	.39¼	@ .60

RED

Antimony, crimson	lb.	.40	@ .49
crimson, 15/17% free	lb.	.36	@ .45
crimson, R.M.P. No. 3	lb.	.50	@
crimson F.	lb.	.35	@ .45
Antimony, golden	lb.	.20	@ .25
golden R.M.P. No. 7	lb.	.31	@
golden, 15/17% free	lb.	$0.18	@ $0.20
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.20	@
Tideco	lb.	.22	¾ .52
7-A	lb.	.35	@
Vermilion, 5% F. S.	lb.	.65	@
Vermilion 15/17% F. S.	lb.	.50	@
Arsenic sulphide, red	lb.	.14¾	@
Gritless red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Indian maroon, English	lb.	.12	@
Iron oxide, reduced	lb.	.12	@
English	lb.	.10	@ .16
pure bright	lb.	.14	@ .16
Spanish	lb.	.03½	@
Maroon oxide	lb.	.08	@ .12
Red oxide	lb.	.03½	@ .04½
crimson	lb.	.06½	@
English	lb.	.12	@ .16
Spanish	lb.	.03	@ .04
Oximony	lb.	.16	@
Pará toner	lb.	1.00	@ 1.10
pure bright	lb.	.14	@ .16
reduced	lb.	.03	@ .04
Toluidine toner	lb.	2.10	@ 2.25
Venetian	lb.	.03½	@ .06
Vermilion, English	lb.	1.30	@ 1.35

WHITE

Albalith	lb.	.07	@ .07½
Aluminum bronze	lb.	.55	@ .60
Lithopone, domestic	lb.	.07	@ .07½
Azo	lb.	.07	@ .07½
Red Seal, imported	lb.	.07¼	@ .07½
Zinc oxide:			
French process, Florence brand			
Green seal	lb.	.10¾	@ .11¼
Red seal	lb.	.09¾	@ .10¼
U. S. P.	lb.	.16	@ .18
White seal	lb.	.12	@ .12¼
Horse Head brands			
Selected	lb.	.08½	@ .09
Special	lb.	.08½	@ .09
XX red	lb.	.08	@ .08½
Leaded brands			
Lehigh	lb.	.07¼	@ .07¾
Standard	lb.	.07¼	@ .07¾
Sterling	lb.	.07¼	@ .07¾
Superior	lb.	.07¼	@ .07¾
Palmerton process			
Kadox, black	lb.	.09¾	@ .10¼
blue	lb.	.09½	@ .10
red	lb.	.09¼	@ .09¾
Snow white	lb.	.13	@
Azo (factory):			
ZZZ (lead free)	lb.	.08	@ .08¼
ZZ (—5% leaded)	lb.	.07¼	@ .07¾
Z (8.15% leaded)	lb.	.07¼	@ .07¾

Colors—*Continued*

YELLOW

Arsenic	*lb.*	$0.75 @	$1.00
Chrome, light and med.	*lb.*	.17½ @	.18
Gritless yellow	*lb.*	3.50 @	
India rubber	*lb.*	.87½ @	
Ochre, domestic	*lb.*	.02 @	.02½
imported	*lb.*	.02½ @	.03

Compounding Ingredients

Aluminum flake (carloads)	*ton*	25.00 @	29.00
filler	*ton*	10.00 @	
hydrate, light	*lb.*	.18 @	.20
Ammonia carbonate	*lb.*	.09 @	.10½
Asbestine	*ton*	20.00 @	25.00
Aluminum silicate	*ton*	22.50 @	25.00
Barium, carbonate, precip.	*ton*	66.00 @	73.00
dust	*lb.*	.05 @	.06
Barytes, imported	*ton*	24.00 @	50.00
pure white C. L.	*ton*	23.90 @	
off color	*ton*	20.00 @	
uniform floated	*ton*	23.90 @	
water ground and floated	*ton*	28.00 @	35.00
Basofor	*lb.*	.04¼ @	
Blanc fixe	*lb.*	.04¼ @	.04½
Carrara filler (factory)	*lb.*	.01¾ @	
Chalk, precip. extra light	*lb.*	.04¼ @	.05
heavy (f.o.b. factory)	*lb.*	.03¼ @	.04
China clay, Dixie	*ton*	22.00 @	32.00
Blue ribbon (carloads)	*ton*	14.00 @	
Blue Ridge	*ton*	20.00 @	30.00
Super Dixie	*lb.*	.02½ @	
Tideco	*ton*	10.00 @	
Cotton flock, black	*lb.*	.12 @	
light-colored	*lb.*	.13 @	.14
white	*lb.*	.14½ @	.21
Cotton linters clean mill-run	*lb.*	.07½ @	
Fossil flour (powdered)	*ton*	60.00 @	
(bolted)	*ton*	60.00 @	
Glue, high grade	*lb.*	.30 @	.40
medium	*lb.*	.20 @	.26
low grade	*lb.*	.16 @	.19
Graphite, flake	*lb.*	.06½ @	.12
amorphous	*lb.*	.05 @	
Infusorial earth (powd.)	*ton*	60.00 @	
(bolted)	*ton*	65.00 @	
Lime (bolted)	*lb.*	.02 @	
Mica, amber	*lb.*	.05 @	
powdered	*lb.*	*.15 @	
white	*lb.*	.06 @	
Pumice stone, powdered	*lb.*	.03 @	.05
Rotten st., powd. (bbls.)	*lb.*	.02½ @	.04½
Soap bark, cut	*lb.*	.08½ @	.10
Soapstone, powdered, gray	*ton*	12.00 @	
Sodium bicarbonate (bbls.)	*lb.*	.02¾ @	
Starch, powd. corn (bags)	*cwt.*	3.22 @	3.32
(bbls.)	*cwt.*	3.49 @	3.59
Talc, soapstone	*ton*	22.50 @	
Terra blanche	*ton*	25.00 @	28.00
Whiting, Alba	*cwt.*	@	
chalk, L. H. B	*ton*	18.00 @	25.00

* Nominal.

Chemical Market—*Continued*

New York Quotations

September 25, 1923

commercial	*cwt.*	$1.00 @	$1.25
English cliffstone	*cwt.*	1.50 @	2.00
gilders (bolted)	*cwt.*	1.10 @	
K. T.	*ton*	@	
Perfection (carloads)	*ton*	22.50 @	25.00
Quaker	*ton*	13.00 @	15.00
Superfine, L. H. B	*ton*	13.50 @	22.50
W. T.	*ton*	13.00 @	
York	*ton*	12.00 @	
Wood pulp, XXX	*ton*	35.00 @	
X (f. o. b. factory)	*ton*	25.00 @	

Mineral Rubber

Genasco (factory)	*ton*	50.00 @	52.00
Gilsonite	*ton*	65.00 @	
Hard hydrocarbon	*ton*	31.00 @	42.00
Liquid rubber	*lb.*	.14 @	
Ohmlac Kapak, K-R	*ton*	50.00 @	60.00
K-4	*ton*	175.00 @	
Parra M. R. flux	*lb*	.06 @	
Soft hydrocarbon	*ton*	30.00 @	40.00
320/340 M. P. hydrocarbon	*ton*	45.00 @	50.00
300/310 M. P. hydrocarbon	*ton*	40.00 @	45.00
Pioneer, M. R., solid (fac.)	*ton*	42.00 @	44.00
M. R. granular	*ton*	52.00 @	54.00
Robertson, M. R., solid	*ton*	35.00 @	75.00
M. R. granular (factory)	*ton*	42.00 @	80.00
Rubrax (factory)	*ton*	60.00 @	
Synpro, gran. M. R. (fac.)	*ton*	55.00 @	

Oils

Avoilas compound	*lb.*	.13 @	
Castor, No. 1, U. S. P.	*lb.*	.14 @	
No. 3, U. S. P.	*lb.*	.13½ @	
Corn	*lb.*	.12½ @	
Cotton	*lb.*	.12½ @	
Cycline	*gal.*	.35 @	.38
Glycerine	*lb.*	.17¾ @	
Linseed, raw	*gal.*	.93 @	
Palm lagos	*lb.*	.09 @	
Palm, niger	*lb.*	.08¾ @	
Peanut, crude	*lb.*	.13 @	
refined	*lb.*	.15 @	
Petrolatum, standard	*lb.*	.06 @	.08
Petrolatum, sticky	*lb.*	.08 @	.10
Pine, steam distilled	*gal.*	.65 @	.68
Rapeseed, refined	*gal.*	.84 @	
blown	*gal.*	1.00 @	
Rosin	*gal.*	.48 @	.50
Synpro	*gal.*	@	
Soya bean	*lb.*	.12 @	
Tar	*gal.*	.26 @	.28
Woburn	*lb.*	.04½ @	

Resins and Pitches

Tar, pine, retort	*bbl.*	11.50 @	12.00
kiln	*bbl.*	12.00 @	12.50
Pitch, Burgundy	*lb.*	.05 @	
coal tar	*lb.*	$0.01¼ @	
Fluxol hardwood	*ton*	40.00 @	60.00
pine tar	*lb.*	.03 @	
ponto	*lb.*	.07½ @	
Rosin, K (bbl.)	280 *lbs.*	6.45 @	
strained (bbl.)	280 *lbs.*	6.25 @	
Shellac, fine orange	*lb.*	*.90 @	
substitute	*gal.*	2.00 @	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	*lb.*	.25 @	.25½
Benzol (90% drums [7.21 lbs. per gal.])	*gal.*	@	
pure (drums)	*gal.*	.42 @	
Carbon bisulphide (dms. [10.81 lbs. per gal.])	*lb.*	.06½ @	.07
tetrachloride (drums, [13.28 lbs. per gal.])	*lb.*	.10½ @	.16
Hartol No. 303	*gal.*	.22½ @	.27½
Motor gasoline (steel bbls.)	*gal.*	.18½ @	
Naphtha, V. M. & P.	*gal.*	.17½ @	
solvent (drums extra)	*gal.*	.28 @	
59@61	*gal.*	.13 @	
63@66	*gal.*	.15 @	
66@68	*gal.*	.16½ @	
Cymene (factory)	*gal.*	1.50 @	
Toluol, pure (7.21 lbs. per gal.)	*gal.*	@	
Turpentine, spirits	*gal.*	1.00 @	
wood, steam distilled	*gal.*	.90 @	

Substitutes

Black	*lb.*	.09 @	.14
Brown	*lb.*	.10 @	.15
White	*lb.*	.10 @	.16
Brown factice	*lb.*	.08 @	.15
White factice	*lb.*	.09 @	.15
T. K., various	*lb.*	.14 @	.18

Vulcanizing Ingredients

Black hypo, T. K., S. F.	*lb.*	.22 @	
13% F. S., L. H. B.	*lb.*	.22 @	
Sulphur chloride	*lb.*	.04 @	.13½
Sulphur, Bergenport brand, 100% pure (bbls.)	*cwt.*	2.70 @	3.05
(bags)	*cwt.*	2.45 @	2.80
Sulphur, Bklyn bd. (bbls.)	*cwt.*	2.75 @	3.30
superfine com. (bgs.)	*cwt.*	2.00 @	2.50
(bbls.)	*cwt.*	2.40 @	2.90

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	*lb.*	.45 @	
ceresine, white	*lb.*	.12 @	
carnauba	*lb.*	.19 @	
montan	*lb.*	.06 @	.06½
ozokerite, black	*lb.*	.18 @	
green	*lb.*	.27 @	.28
sweet wax	*lb.*	.10 @	.12
Paraffin			
122/124 white crude scale	*lb.*	.03 @	
124/126 white crude scale	*lb.*	.03¼ @	
120/122 fully refined	*lb.*	.03½ @	
125/127 fully refined	*lb.*	.03⅞ @	

SELECTING CORRECT TYPE OF TRUCK TIRE

Choice of the correct type of truck tire should depend on the class of service in which the truck is engaged. There are three distinct types from which to select, the pneumatic, solid, and cushion. Each of these has been developed to meet a special and different class of truck service and they are not interchangeable. Each is practical and satisfactory when used as intended. Any of these tires can be destroyed by abuse; even the solid is not proof against the common misuse of overloading, much less the other two.

Pneumatic truck tires should be used for light loads where speed is important or where the load is of such a fragile nature as to require special cushioning.

Solid tires are best for heavy loads carried at slow or medium speeds. They should not be overloaded as that not only decreases their cushioning effect but results in their rapid destruction.

Cushion tires resemble solid tires in general appearance. They are, in fact, a modification of them, derived in a variety of ways, chiefly by containing a single cavity or a series of perforations or cuts in the tire body. Cushion tires gain their easy riding quality through their ability to distort under the load. Under an excessive load the distortion will cause side stresses and result in rapidly breaking down the tire. Some forms of cushion tire will break down under abuse as readily as a pneumatic, while others will outlast the solid tire. In general a given size of cushion tire is rated to carry the same load as the next smaller solid tire size. Cushion tires are best under moderate loads and moderate speeds.—United States Tire Co.

DEMAND FOR CARRIAGE TIRES STILL STRONG

Notwithstanding the ubiquity of the automobile, the horse-drawn vehicle is still a popular means of conveyance in certain areas, a fact evidenced by the steady sales of solid rubber carriage tires. In Ohio, where the automobile and truck registration ranks third in the United States, the demand for carriage tires is particularly strong. Other states ranking high in the number of horse-drawn vehicles in use are Kentucky and Tennessee, with Indiana, Missouri, Arkansas and Pennsylvania lining up.

The renewal business, refitting old vehicles with new solid tires, is the principal factor in the carriage tire demand. Another factor is the horse-drawn cab, still in general use for meeting incoming trains in several cities—Charleston, South Carolina, and St. Augustine, Florida, for instance—and in many towns and hamlets throughout the country. In New York City and Brooklyn, New York, the foreign funeral directors still cling to the horse-drawn equipage for funerals. In factories in Texas and California there is a motorized outlet for carriage tires, these being employed on two and four-wheeled trailers which are hooked on to light cars and used by tourists and for delivery purposes by farmers, hucksters, contractors, paper hangers, etc.

One large rubber company, which began the year with a million feet of carriage tire rubber on hand, found this stock depleted in three months' time and advance orders piling up.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	April, 1922		April, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	.....	.....	178,680	$58,517
Netherlands	166,536	$31,522	1,486,748	432,990
Portugal	.....	.....	.....	.....
United Kingdom	2,584,240	451,557	11,896,258	4,268,382
Canada	.....	.....	.....	.....
Central America	.....	.....	17,228	3,235
Mexico	145,300	29,060	56,000	11,200
Brazil	1,113,748	120,503	2,294,246	500,206
Peru	141,449	30,180	74,640	24,881
Other South America	10,215	3,599	327,505	82,017
British East Indies	33,637,491	5,625,333	41,949,105	13,210,336
Dutch East Indies	5,335,292	955,305	9,717,255	2,938,965
Other countries	272,588	23,039	1,582,349	395,085
Totals	43,407,359	$7,272,098	69,580,014	$21,925,814
Balata	171,064	90,608	108,095	56,932
Jelutong (Pontianak)	528,007	33,793	1,385,595	92,503
Gutta percha	265,017	22,227	107,682	17,804
Rubber scrap	139,106	2,100	2,233,778	91,559
Totals, unmanufactured	44,520,553	$7,420,826	73,415,164	$22,184,612
Chicle ..... *dutiable*	1,595,779	817,577	.....	.....
MANUFACTURED—*dutiable*				
Rubber belting	.....	.....	72,801	53,336
Other manufactures of and substitutes for rubber	.....	162,624	.....	64,193

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	126,599	$11,642	542,093	$49,772
Scrap and old	600,880	24,074	1,501,153	65,662
Footwear				
Boots ..... *pairs*	12,202	36,148	23,340	73,742
Shoes ..... *pairs*	32,239	30,315	49,172	50,293
Canvas shoes with rubber soles ..... *pairs*	437,515	336,687	465,198	333,521
Druggists' rubber sundries	66,133	73,135	74,644	67,983
Hard rubber goods				
Battery jars and accessories	49,279	20,763	86,506	21,735
Other electrical supplies	6,580	5,070	24,144	11,147
Other hard rubber goods	25,779	23,341	66,782	48,619
Tires				
Pneumatic casings				
For automobiles	99,062	1,374,343	166,865	1,714,702
Others	2,920	12,643	4,937	18,986
Pneumatic tubes				
For automobile	73,176	154,422	118,996	185,581
Others	2,489	2,393	4,651	4,695
Solid tires				
For automobiles and motor trucks	4,489	100,639	7,520	184,926
Others	73,136	18,359	75,646	20,351
All other tires	.....	.....	.....	.....
Tire repair material	53,471	21,781	72,516	28,635
Belting	133,198	69,394	230,305	133,234
Hose	268,373	96,157	319,257	124,256
Packing	59,965	29,324	139,508	62,847
Soles and heels	128,144	54,023	169,282	60,945
Thread	73,589	81,606	130,295	127,578
Other rubber manufactures	460,538	248,040	650,050	313,538
Totals, manufactured	.....	$2,824,299	.....	$3,702,748

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	964,869	$144,100	1,713,627	$536,358
Balata	48,859	31,789	32,496	7,300
Jelutong (Pontianak)	.....	.....	.....	.....
Totals, unmanufactured	1,013,728	$175,889	1,746,123	$543,658
MANUFACTURED				
Gutta percha and india rubber	.....	$51	292	$260
India rubber substitutes	20,835	3,109	.....	.....
Totals, manufactured	20,835	$3,160	292	$260

[1] Details of exports of domestic merchandise by countries during April, 1923, appeared on pages 680-683 of our July issue.

Imports of Crude Rubber Into the United States by Customs Districts

	July, 1922		July, 1923	
	Pounds	Value	Pounds	Value
Vermont	3,170	$539	.....	.....
Massachusetts	999,705	138,563	837,461	$221,095
New York	55,060,649	8,006,224	42,136,875	12,313,472
Philadelphia	2,165	87	278	21
Los Angeles	430,220	60,453	997,120	287,032
San Francisco	190,500	23,827	271,272	76,716
Chicago	349	134	.....	.....
Colorado	168,000	29,927	391,792	110,504
Totals	56,854,758	$8,259,754	44,634,798	$13,008,840

Custom House Statistics

New York

Imports of Crude and Manufactured Rubber

	April, 1922		April, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	.....	.....	22,090	$7,388
France	.....	.....	178,680	58,517
Germany	.....	.....	188,174	42,272
Netherlands	166,536	$31,522	1,486,748	432,990
England	2,583,990	451,359	11,679,268	4,186,562
Guatemala	.....	.....	5,562	674
Nicaragua	.....	.....	4,400	982
Panama	.....	.....	7,266	1,579
Dominican Republic	.....	.....	64,045	4,973
Brazil	1,113,748	120,503	2,294,246	500,206
Chile	523	167	.....	.....
Colombia	2,944	792	229,928	63,824
Ecuador	.....	.....	89,299	12,118
Dutch Guiana	6,748	4,640	8,278	6,075
Peru	141,449	30,180	74,640	24,881
British India	79,520	12,520	134,400	31,611
Ceylon	4,488,517	711,220	5,874,626	1,988,815
Straits Settlements	28,047,794	4,743,190	29,188,689	8,894,399
China	.....	.....	203,129	58,675
Java	1,635,712	285,871	5,508,018	1,465,088
Dutch East Indies	3,644,426	656,097	4,097,454	1,436,861
Japan	.....	.....	1,028,160	260,355
Philippine Islands	.....	.....	56,083	17,342
Far East Republic	239,680	16,777	.....	.....
French Indo-China	22,400	4,477	.....	.....
British East Africa	10,508	1,785	.....	.....
Totals	42,184,495	$7,071,100	62,423,183	$19,496,187
Balata	171,064	90,608	108,095	56,932
Jelutong (Pontianak)	538,007	33,793	1,385,595	92,503
Gutta percha	265,017	22,227	107,682	17,804
Rubber scrap and reclaimed	450	30	1,243,618	44,816
Totals, unmanufactured	43,159,033	$7,217,758	65,268,173	$19,708,242
Chicle ..... *dutiable*	1,119,416	$591,543	393,421	$169,864
MANUFACTURED—*dutiable*				
Rubber belting for machinery	.....	.....	9,771	11,988
Other manufactures of rubber and substitutes	.....	111,215	.....	54,639
Totals, manufactured	.....	$111,215	9,771	$66,627

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	5,237	$699	40,159	$4,010
Scrap and old	421,686	19,150	673,951	44,771
Footwear				
Boots ..... *pairs*	3,847	9,298	9,209	31,558
Shoes ..... *pairs*	17,854	16,910	45,911	46,872
Canvas shoes with rubber soles ..... *pairs*	289,866	228,923	298,156	214,556
Druggists' rubber sundries	48,634	52,001	52,170	48,286
Hard rubber goods				
Battery jars and accessories	4,812	1,784	19,038	6,486
Other electrical supplies	3,953	2,546	8,001	3,146
Other hard rubber goods	9,777	10,565	60,718	41,932
Tires				
Pneumatic casings				
For automobiles	80,697	1,114,757	127,470	1,331,226
Others	2,295	3,449	3,227	13,099
Pneumatic tubes				
For automobiles	51,514	109,912	94,388	153,692
Others	2,186	2,021	3,638	3,584
Solid tires				
For automobiles and motor trucks	2,036	49,900	4,708	120,439
Others	67,014	16,533	75,335	16,492
Tire repair materials	32,935	13,227	52,073	22,012
Belting	60,675	35,235	150,753	83,856
Hose	98,290	38,855	202,403	80,581
Packing	39,838	17,653	66,229	30,036
Soles and heels	71,700	34,041	97,027	40,993
Thread	47,526	59,332	77,893	79,036
Other rubber manufactures	141,265	196,266	298,961	167,778
Totals, manufactured	.....	$1,943,057	.....	$2,584,441

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	203,800	$20,732	4,518	$1,559
Balata	48,859	31,789	32,496	7,300
Gutta percha	600	1,200	.....	.....
Totals, unmanufactured	253,259	$53,721	37,014	$8,859
MANUFACTURED				
Rubber manufactures	.....	.....	292	260
Rubber substitutes	.....	.....	.....	.....
Totals, manufactured	.....	.....	292	$260

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Cametá
AUGUST 13. By "Benedict," Pará and Manáos.					
H. A. Astlett & Co.	4,100	.....	11,700	.....	.....
H. A. Astlett & Co.	‡64,400	‡10,200	‡25,700	‡2,000	.....
AUGUST 30. By "Camoens," Pará and Manáos.					
H. A. Astlett & Co.	53,800	.....	8,500	.....	.....
Paul Bertuch	57,716	.....	6,270	.....	.....
General Rubber Co.	.....	.....	5,600	.....	.....
L. Littlejohn & Co., Inc.	.....	1,120	.....	.....	.....
Meyer & Brown, Inc.	66,105	.....	4,756	11,951	.....
SEPTEMBER 4. By "Alban," Pará and Iquitos.					
H. A. Astlett & Co.	1,070	.....	59,950	.....	.....
Paul Bertuch	.....	.....	139,795	28,087	.....

‡Washed and dried in Brazil.

Plantations

(Figured at 180 lbs. to the bale or case)

	Pounds
AUGUST 16. By "City of Pittsburgh," Singapore.	
H. A. Astlett & Co.	168,000
H. A. Astlett & Co.	*89,600
H. Muehlstein & Co., Inc.	33,600
AUGUST 18. By "Oanfa," Far East.	
H. A. Astlett & Co.	123,200
H. A. Astlett & Co.	*56,000
Baird Rubber & Trading Co., Inc.	302,400
Fisk Rubber Co.	22,400
General Rubber Co.	92,470
Hood Rubber Co.	33,000
Hood Rubber Co.	*56,000
Meyer & Brown, Inc.	199,360
H. Muehlstein & Co., Inc.	123,200
Poel & Kelly, Inc.	673,634
Chas. T. Wilson Co., Inc.	276,640
AUGUST 20. By "Idomeneus," Far East.	
H. A. Astlett & Co.	37,000
General Rubber Co.	165,760
L. Littlejohn & Co., Inc.	183,680
Meyer & Brown, Inc.	22,400
H. Muehlstein & Co., Inc.	44,800
Poel & Kelly, Inc.	282,194
Chas. T. Wilson Co., Inc.	11,200
AUGUST 23. By "Inkum," Far East.	
H. A. Astlett & Co.	22,400
Fisk Rubber Co.	112,000
General Rubber Co.	112,000
F. R. Henderson & Co., Inc.	56,000
Hood Rubber Co.	*33,600
L. Littlejohn & Co., Inc.	123,200
Poel & Kelly, Inc.	22,440
Chas. T. Wilson Co., Inc.	78,400
AUGUST 23. By "Keelung," Far East.	
Baird Rubber & Trading Co., Inc.	22,400
L. Littlejohn & Co., Inc.	168,000
H. Muehlstein & Co., Inc.	78,400
Poel & Kelly, Inc.	152,400
Chas. T. Wilson Co., Inc.	123,200
AUGUST 26. By "Anniston City," Far East.	
H. A. Astlett & Co.	56,000
Baird Rubber & Trading Co., Inc.	33,600
General Rubber Co.	259,840
F. R. Henderson & Co., Inc.	940,800
Hood Rubber Co.	44,909
Hood Rubber Co.	*134,158
L. Littlejohn & Co., Inc.	185,920
H. Muehlstein & Co., Inc.	436,800
Poel & Kelly, Inc.	27,243
Fred Stern & Co., Inc.	7,301
AUGUST 27. By "Keemun," Far East.	
H. A. Astlett & Co.	33,600
Baird Rubber & Trading Co., Inc.	33,600
Fisk Rubber Co.	123,200
General Rubber Co.	22,400
Hood Rubber Co.	11,200
L. Littlejohn & Co., Inc.	309,120
H. Muehlstein & Co., Inc.	56,000
Poel & Kelly, Inc.	583,591
Fred Stern & Co., Inc.	87,360
Chas. T. Wilson Co., Inc.	22,400
AUGUST 27. By "Satartia," Far East.	
H. A. Astlett & Co.	78,400
Baird Rubber & Trading Co.	190,400
Fisk Rubber Co.	78,400
General Rubber Co.	11,200
F. R. Henderson & Co., Inc.	22,400
L. Littlejohn & Co., Inc.	1,140,160
Meyer & Brown, Inc.	257,600
H. Muehlstein & Co., Inc.	212,800
Poel & Kelly, Inc.	535,508
Fred. Stern & Co., Inc.	39,290
Chas. T. Wilson Co., Inc.	22,400
AUGUST 30. By "Camoens," Manáos.	
Poel & Kelly, Inc.	32,748
SEPTEMBER 2. By "Hayo Maru," Far East.	
F. R. Henderson & Co., Inc.	13,440
L. Littlejohn & Co., Inc.	127,680
Meyer & Brown, Inc.	2,240
SEPTEMBER 2. By "Lucerie," Far East.	
H. A. Astlett & Co.	89,600
L. Littlejohn & Co., Inc.	123,200
H. Muehlstein & Co., Inc.	11,200
Chas. T. Wilson Co., Inc.	22,400
SEPTEMBER 5. By "President Garfield," London.	
Hood Rubber Co.	4,436
SEPTEMBER 6. By "City of Naples," Far East.	
Fisk Rubber Co.	3,360
J. T. Johnstone & Co., Inc.	61,600
L. Littlejohn & Co., Inc.	67,200
Poel & Kelly, Inc.	45,293
SEPTEMBER 8. By "Diomed," Far East.	
H. A. Astlett & Co.	212,000
Baird Rubber & Trading Co., Inc.	89,600
Fisk Rubber Co.	22,400
General Rubber Co.	11,200
F. R. Henderson & Co., Inc.	11,200
Hood Rubber Co.	*115,420
L. Littlejohn & Co., Inc.	228,480
Meyer & Brown, Inc.	123,200
H. Muehlstein & Co., Inc.	78,400
Fred Stern & Co., Inc.	22,400
Chas. T. Wilson Co., Inc.	188,160
SEPTEMBER 10. By "Hamburg Maru," Far East.	
Fisk Rubber Co.	78,040
L. Littlejohn & Co., Inc.	41,440
Meyer & Brown, Inc.	22,400
SEPTEMBER 10. By "Jeseric," Far East.	
H. A. Astlett & Co.	224,000
Baird Rubber & Trading Co., Inc.	56,000
Hood Rubber Co.	*27,900
L. Littlejohn & Co., Inc.	280,000
Meyer & Brown, Inc.	112,000
H. Muehlstein & Co., Inc.	78,400
H. Muehlstein & Co., Inc.	*56,600
Poel & Kelly, Inc.	394,800
Fred Stern & Co., Inc.	22,400
Chas. T. Wilson Co., Inc.	212,800
SEPTEMBER 10. By "M. S. Dollar," Singapore.	
H. A. Astlett & Co.	22,400
Baird Rubber & Trading Co., Inc.	22,400
Fisk Rubber Co.	22,400
General Rubber Co.	512,993
Hood Rubber Co.	*33,000
L. Littlejohn & Co., Inc.	459,200
Meyer & Brown, Inc.	56,000
Fred. Stern & Co., Inc.	123,991
SEPTEMBER 10. By "Vechtayk," Far East.	
Fisk Rubber Co.	230,720
General Rubber Co.	179,777
F. R. Henderson & Co., Inc.	56,000
Hood Rubber Co.	22,294
Hood Rubber Co.	*249,050
L. Littlejohn & Co., Inc.	493,360
H. Muehlstein & Co., Inc.	78,400
Chas. T. Wilson Co., Inc.	350,560
SEPTEMBER 11. By "Roman Prince," Singapore.	
H. A. Astlett & Co.	22,400
Baird Rubber & Trading Co., Inc.	358,400
Fisk Rubber Co.	67,200
Hood Rubber Co.	24,800
L. Littlejohn & Co., Inc.	392,000
Meyer & Brown, Inc.	224,000
H. Muehlstein & Co., Inc.	145,600
Fred. Stern & Co., Inc.	34,080
SEPTEMBER 14. By "Scythia," London.	
Hood Rubber Co.	*2,200
SEPTEMBER 16. By "Kendal Castle," Belewan.	
General Rubber Co.	928,122
J. T. Johnstone & Co., Inc.	12,320
L. Littlejohn & Co., Inc.	329,280
Fred. Stern & Co., Inc.	33,920
SEPTEMBER 18. By "Schoharie," London.	
Fred. Stern & Co., Inc.	*135,352
SEPTEMBER 19. By "Telemachus," Far East.	
Fisk Rubber Co.	24,600
L. Littlejohn & Co., Inc.	179,200
Fred. Stern & Co., Inc.	85,120

*Arrived at Boston.

Balata

	Pounds
AUGUST 30. By "Camoens," Far East.	
Paul Bertuch	2,180
AUGUST 30. By "Surinam," Cayenne.	
Middleton & Co., Ltd.	17,415
SEPTEMBER 3. By "Mayaro," Cayenne.	
Middleton & Co., Ltd.	17,700
SEPTEMBER 4. By "Alban," Manáos and Iquitos.	
H. A. Astlett & Co.	40,600

Gutta Siak

	Pounds
AUGUST 26. By "Anniston City," Far East.	
F. R. Henderson & Co., Inc.	56,000

Pontianak

	Pounds
AUGUST 26. By "Anniston City," Far East.	
F. R. Henderson & Co., Inc.	143,360

Guayule

	Pounds
AUGUST 22-SEPTEMBER 19. By "Railways," Mexico.	
Continental Rubber Co.	368,000

United States Crude and Waste Rubber Imports for 1923 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1923	Total 1922	Balata	Miscellaneous	Waste
January ..... *tons*	29,354	1,233	549	61	.....	.....	31,197	21,867	64	257	382
February	21,815	2,004	308	93	.....	.....	24,220	28,973	25	397	684
March	31,673	1,482	742	19	.....	.....	33,916	28,702	124	738	863
April	29,922	1,095	399	30	142	.....	31,588	14,444	40	1,504	507
May	34,609	1,042	333	24	167	9½	36,184½	20,622	55	463	361
June	31,574	1,032	286	42	.....	.....	32,934	15,750	28	771	300
July	17,459	636	146	23	328	17	18,609	25,245	68	436	121
August	18,083	297	88	30	164	12	18,674	21,764	54	1,039	127
Totals, 8 months, 1923. *tons*	214,489	8,821	2,851	322	801	38½	227,322½	.....	458	5,605	3,345
Totals, 8 months, 1922	169,026	6,859	1,031	48	281	122	.....	177,367	205	3,737	414

Compiled from statistics supplied by the Rubber Association of America, Inc.

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots		Shoes		Canvas Shoes with Rubber Soles		Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
					Pairs	Value	Pairs	Value	Pairs	Value			
EUROPE													
Austria	.....	.....	.....	.....	24	$66	4,896	$5,267	7,258	$14,290	$281	.....	.....
Belgium	$460	$8,886	$914	$3,147	60	197	264	147	120	132	.....	$796	$958
Bulgaria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Czechoslovakia	.....	70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	215	.....	649	.....	.....	.....	2,400	2,698	44	82	.....	31,205	2,095
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finland	1,732	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	549	.....
France	5,053	293	2,309	7,750	48	102	17	20	1,488	1,164	.....	34,026	924
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	518	.....
Gibraltar	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	.....	22	.....	.....	.....	240	188	.....	.....	135	535	21
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	100	296	260	185	.....	.....	.....	.....	.....
Italy	179	162	.....	2,390	1,503	4,580	2,784	1,731	24	10	65	3,087	.....
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	.....	704	27	.....	.....	.....	.....	.....	984	1,212	117	315	.....
Norway	1,415	1,348	.....	.....	1,123	2,962	1,827	1,844	.....	.....	281	1,722	1,202
Portugal	.....	34	.....	.....	.....	.....	.....	.....	.....	.....	78	175	.....
Rumania	.....	.....	1,322	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	1,018	230	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,055	238
Sweden	119	203	926	.....	.....	.....	564	1,971	.....	.....	890	17,888	420
Switzerland	437	.....	.....	.....	.....	.....	27,211	19,424	.....	.....	.....	.....	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	18,400	15,000	.....	.....	.....	.....	.....
Ukraine	.....	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	8,386	17,781	1,902	36,519	8,766	17,568	5,544	2,839	4,598	5,449	938	16,605	5,284
Scotland	3,733	126	.....	.....	1,508	2,074	429	230	.....	.....	.....	6,251	399
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,351
TOTALS, EUROPE	$22,747	$29,951	$8,071	$49,806	13,132	$27,845	64,836	$51,544	14,516	$22,339	$2,785	$122,727	$13,892
NORTH AMERICA													
Canada—Maritime Provinces	$85	$67	$1	.....	492	$1,713	16	$49	.....	.....	$122	.....	.....
Quebec and Ontario	15,868	14,704	8,083	$2,774	18	53	2,065	5,202	408	$331	400	$39,341	$30,770
Prairie Provinces	11	530	90	.....	18	50	769	1,005	71	65	.....	1,308	144
Brit. Columbia and Yukon	1,220	961	735	.....	136	610	1,310	1,454	108	420	.....	220	83
British Honduras	.....	128	.....	.....	.....	.....	13	45	173	180	.....	.....	.....
Costa Rica	442	560	30	.....	.....	.....	114	75	.....	.....	842	328	59
Guatemala	19	78	13	.....	.....	.....	.....	.....	1,930	1,568	1,068	56	679
Honduras	226	3,127	210	.....	.....	.....	.....	.....	1,415	1,621	1,630	.....	256
Nicaragua	459	299	79	.....	.....	.....	50	30	184	226	332	.....	.....
Panama	112	6,870	423	.....	.....	.....	.....	.....	7,113	6,685	1,245	59	.....
Salvador	437	105	60	.....	.....	.....	.....	.....	144	93	1,006	52	.....
Mexico	16,888	20,564	6,582	1,115	337	1,118	270	268	30,618	26,632	12,329	1,440	1,019
Miquelon and St. Pierre Islands	16	.....	.....	.....	192	671	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	1,046	368	62	.....	4,908	14,138	1,448	1,502	3,293	1,818	220	80	.....
Bermuda	317	51	.....	.....	.....	.....	.....	.....	727	747	15	.....	.....
Barbados	.....	12	86	.....	.....	.....	.....	.....	130	57	.....	.....	284
Jamaica	150	697	.....	.....	.....	.....	.....	.....	3,659	2,616	760	113	426
Trinidad and Tobago	.....	360	588	.....	.....	.....	.....	.....	809	567	48	.....	158
Other British West Indies	.....	9	255	.....	.....	.....	36	23	1,830	1,558	.....	.....	.....
Cuba	1,041	22,053	8,751	52	54	248	232	162	61,790	38,411	12,839	8,959	4,738
Dominican Republic	713	415	159	.....	.....	.....	.....	.....	2,034	1,494	28	390	879
Dutch West Indies	.....	32	.....	.....	.....	.....	360	363	8,374	6,483	219	.....	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	77	351	129	.....	.....	.....	.....	.....	946	1,040	60	.....	182
Virgin Islands of United States	.....	150	.....	.....	.....	.....	.....	.....	324	299	102	.....	24
TOTALS, NORTH AMERICA	$39,127	$72,491	$26,336	$3,941	6,155	$18,601	6,683	$10,178	126,100	$92,911	$33,265	$52,346	$39,701
SOUTH AMERICA													
Argentina	$3,054	$5,136	$1,253	.....	51	$190	10,989	$9,161	41,622	$26,190	$6,385	$2,106	$11,522
Bolivia	2,977	245	39	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
Brazil	21,597	2,679	1,847	.....	.....	.....	.....	.....	.....	.....	.....	732	1,676
Chile	7,103	6,204	383	.....	158	493	12	25	3,672	2,197	1,924	2,024	1,423
Colombia	2,359	3,237	249	.....	.....	.....	61	74	3,554	2,718	205	2,222	.....
Ecuador	122	.....	69	.....	.....	.....	240	199	2,350	1,786	.....	84	.....
British Guiana	.....	25	.....	.....	.....	.....	.....	.....	240	416	.....	.....	300
Dutch Guiana	75	.....	.....	.....	.....	.....	.....	.....	72	70	.....	.....	.....
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	709	2,951	2,544	.....	.....	.....	144	111	72	54	338	1,117	192
Uruguay	4,039	465	1,348	.....	112	319	2,407	2,081	14,829	11,540	1,688	1,219	1,890
Venezuela	208	1,022	468	.....	.....	.....	.....	.....	.....	.....	2,418	1,348	.....
TOTALS, SOUTH AMERICA	$42,243	$21,964	$8,200	.....	321	$1,002	13,853	$11,651	66,411	$44,971	$14,964	$10,852	$17,003
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$1,299	$708	$343	.....	.....	.....	120	$92	602	$766	.....	$2,427	.....
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	115	257
Straits Settlements	341	846	86	.....	.....	.....	.....	.....	620	456	207	.....	544
China	2,023	1,097	3,083	.....	564	1,057	6,871	5,714	258	182	.....	2,340	2,290
Chosen	.....	10	.....	.....	.....	.....	569	515	.....	.....	.....	.....	.....
Java and Madura	3,815	.....	927	.....	.....	.....	.....	.....	142	136	84	3,840	1,099
Other Dutch East Indies	.....	.....	271	.....	.....	.....	.....	.....	108	149	.....	1,688	156
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	125	212	445	.....	.....	.....	2,574	2,003	1,032	1,013	.....	.....	199
Japan	4,297	4,380	6,192	14,932	23,548	27,374	18,086	17,777	216	190	.....	4,133	3,032
Kwangtung, leased territory	.....	124	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palestine and Syria	.....	.....	.....	.....	.....	.....	4,810	4,197	.....	.....	.....	.....	423
Persia	.....	33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	9,027	2,087	3,368	.....	.....	.....	3,120	1,677	87,474	58,416	6,240	3,323	2,573
Russia in Asia	.....	570	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	516	384	.....	.....	.....
Turkey in Asia	.....	.....	.....	.....	.....	.....	4,150	3,740	.....	.....	.....	.....	.....
TOTALS, ASIA	$20,927	$10,067	$14,715	$14,932	24,112	$28,431	40,300	$35,715	90,968	$61,692	$6,531	$17,866	$10,573

United States by Countries During July, 1923

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Other Rubber Manufactures Value
.....	440	$7,128	$236	.....	.....	436	$879	$40	.....	.....	.....	.....	.....	$528
$161	479	7,475	.....	.....	.....	458	821	.....	$523	.....	.....	.....	.....	3,334
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150
.....	130	1,306	.....	$265	.....	247	463	.....	217	.....	.....	.....	.....	.....
.....	1,480	16,875	.....	.....	.....	1,804	2,760	.....	1,935	$467	.....	.....	.....	6,985
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58
.....	383	4,557	.....	.....	.....	568	1,035	.....	.....	.....	.....	.....	$359	134
1,348	546	3,732	.....	.....	.....	27	170	.....	9,554	2,335	$362	.....	8,414	4,015
.....	.....	.....	.....	.....	.....	.....	.....	.....	563	.....	.....	.....	.....	342
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,082	15,078	.....	3,160	.....	1,272	2,510	.....	85	.....	.....	.....	.....	.....
.....	35	667	.....	.....	.....	100	247	.....	.....	.....	.....	.....	.....	.....
.....	145	1,595	.....	.....	.....	100	150	.....	.....	.....	.....	.....	.....	.....
375	193	1,030	2,261	.....	.....	275	516	473	104	310	.....	.....	.....	2,179
.....	2	60	.....	.....	.....	2	8	.....	.....	.....	.....	.....	.....	.....
.....	79	969	.....	.....	.....	59	87	.....	.....	.....	.....	.....	.....	.....
.....	1,052	13,741	607	654	.....	1,238	2,046	142	43	12	.....	.....	.....	1,436
.....	3,226	46,912	420	3,907	.....	2,769	4,386	68	662	.....	49	.....	.....	305
.....	359	3,920	.....	.....	.....	245	411	31	32	81	.....	.....	.....	820
.....	121	1,662	.....	.....	.....	44	63	.....	43	.....	.....	.....	.....	74
.....	760	9,174	.....	4,483	.....	760	1,300	.....	1,751	1,265	.....	.....	324	401
.....	4,703	54,031	.....	1,316	.....	4,695	10,931	.....	791	419	.....	.....	.....	3,316
.....	299	5,837	54	.....	.....	305	693	11	62	.....	.....	.....	.....	124
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$2,443	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	18,945	148,563	1,015	50,941	.....	21,153	31,224	.....	1,223	6,005	3,987	.....	5,080	53,754
357	381	4,661	.....	1,690	.....	488	932	.....	240	383	.....	.....	481	.....
.....	458	4,160	.....	.....	.....	375	486	.....	.....	.....	.....	.....	.....	.....
$2,256	35,298	$353,133	$4,593	$66,416	.....	37,420	$62,118	$765	$17,828	$11,277	$4,398	$2,443	$14,658	$77,955
$140	21	$300	$145	$55	$14	6	$12	.....	$79	$66	$49	.....	$372	$2,866
1,066	5,925	54,704	776	2,202	48	1,654	3,387	$10	2,527	8,370	822	$1,835	4,887	92,300
7	1,325	10,402	63	211	75	1,243	1,781	.....	653	420	.....	.....	135	8,285
3,581	69	917	3	617	.....	64	83	.....	15	765	247	.....	548	1,783
.....	5	39	.....	.....	.....	28	58	.....	32	4	.....	.....	.....	.....
3,068	66	1,051	44	413	123	83	174	16	.....	.....	.....	.....	53	356
118	92	1,756	81	.....	799	41	88	.....	23	12	.....	.....	.....	73
231	204	4,207	.....	.....	.....	212	495	.....	29	434	.....	.....	594	159
42	.....	.....	.....	.....	.....	.....	.....	.....	10	172	.....	.....	.....	148
394	246	3,231	84	1,598	305	490	826	6	63	317	25	.....	12	1,052
734	6	227	.....	.....	.....	.....	.....	.....	19	14	.....	.....	24	253
7,370	7,551	79,413	1,253	9,275	1,505	10,138	15,562	287	1,409	3,476	297	54	1,878	15,500
446	6	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,453	292	3,512	.....	.....	.....	253	407	.....	96	150	.....	.....	18	527
.....	.....	.....	.....	.....	180	.....	.....	.....	.....	78	.....	.....	.....	52
.....	45	572	.....	.....	.....	116	209	.....	.....	.....	.....	.....	.....	.....
.....	583	7,058	.....	241	34	629	1,025	.....	10	7	.....	.....	.....	1,807
47	172	2,111	85	248	.....	236	252	.....	15	65	210	259	.....	319
152	58	725	310	.....	.....	64	143	.....	43	34	15	38	.....	499
20,781	5,780	65,176	4,943	23,001	.....	6,478	11,008	118	1,398	5,469	605	234	.....	13,946
308	1,426	15,113	99	1,732	.....	1,550	2,525	.....	125	359	.....	21	.....	315
85	117	1,241	.....	.....	.....	158	256	.....	14	.....	.....	.....	.....	106
.....	100	1,008	.....	85	18	50	80	.....	29	.....	.....	.....	.....	.....
466	137	2,064	.....	.....	96	361	581	.....	27	140	.....	.....	.....	562
.....	41	483	.....	.....	.....	46	67	.....	.....	86	.....	.....	.....	.....
$40,489	24,267	$255,333	$7,886	$39,678	$3,197	23,900	$39,019	$437	$6,616	$20,438	$2,270	$2,441	$8,521	$140,908
$1,209	6,354	$71,973	.....	$2,068	$160	6,219	$9,322	$77	$1,238	$3,952	$300	$40	$1,130	$8,516
82	4	102	.....	.....	.....	4	13	.....	.....	.....	.....	.....	.....	.....
.....	2,186	25,595	.....	1,085	.....	4,099	6,937	826	655	341	.....	.....	825	2,975
.....	332	4,227	.....	1,178	690	706	1,170	.....	126	910	.....	687	364	1,100
.....	455	9,029	.....	551	369	758	1,456	67	55	378	.....	10	.....	1,557
.....	130	2,165	.....	.....	.....	112	231	.....	137	.....	.....	.....	.....	666
.....	82	927	.....	.....	75	160	304	.....	.....	.....	.....	.....	.....	255
.....	64	526	.....	.....	.....	32	44	.....	.....	.....	.....	.....	.....	279
.....	22	309	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
2,864	917	12,900	$97	1,454	.....	748	1,375	.....	27	207	.....	29	.....	1,877
1,137	980	12,096	.....	229	.....	200	354	.....	.....	880	.....	.....	.....	1,213
100	759	10,097	139	68	265	1,622	2,578	20	230	760	.....	74	750	867
$5,392	12,285	$149,946	$236	$6,633	$1,559	14,660	$23,784	$990	$2,468	$7,428	$300	$840	$3,069	$19,505
.....	216	$1,972	.....	.....	.....	137	$202	.....	.....	.....	.....	.....	.....	.....
.....	681	6,753	.....	$2,929	.....	489	943	.....	$46	$1,472	.....	.....	.....	$1,421
.....	209	2,111	.....	456	.....	49	100	.....	.....	.....	.....	.....	.....	150
.....	407	4,063	$19	530	.....	161	290	$3	50	.....	.....	.....	.....	352
524	572	7,629	26	102	.....	204	459	.....	145	2,063	.....	$92	$40	4,904
.....	6	60	14	.....	.....	4	8	.....	.....	.....	.....	.....	.....	17
53	1,339	22,686	147	7,537	$1,927	1,141	2,536	.....	206	223	.....	.....	.....	811
.....	1,070	9,917	129	417	.....	101	211	.....	.....	.....	.....	.....	.....	201
.....	28	60	.....	.....	.....	8	12	.....	.....	.....	.....	.....	.....	.....
.....	2	22	.....	.....	.....	102	168	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	75	.....	.....	.....	.....	.....	.....	896	.....	.....	.....	384
.....	2,817	27,837	3,515	3,444	.....	1,620	2,453	553	315	2,379	.....	456	411	5,904
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	279	3,343	.....	.....	.....	97	244	.....	.....	.....	.....	.....	.....	20
.....	50	365	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
1,995	5,534	64,197	1,332	8,012	8,400	4,203	6,249	1,000	910	1,479	$20	501	10	5,437
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,025	.....	.....
15	64	717	.....	.....	.....	88	162	.....	.....	128	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$2,587	13,274	$151,732	$5,257	$23,427	$10,327	8,404	$14,037	$1,556	$1,672	$8,640	$20	$2,074	$461	$19,621

Exports of India Rubber Manufactures from the

OCEANIA	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
Australia	$4,174	$5,927	$320	.....	180	$633	.....	.....	4,884	$4,458	.....	$12,401	$8,047
British Oceania	.....	.....	.....	.....	.....	.....	36	$44	468	547	.....	.....	.....
French Oceania	.....	38	.....	.....	.....	.....	.....	.....	1,571	1,620	$16	.....	.....
New Zealand	4,043	3,823	898	.....	477	1,781	.....	.....	.....	.....	310	703	1,263
TOTALS, OCEANIA	$8,217	$9,788	$1,218	.....	657	$2,414	36	$44	6,923	$6,625	$326	$13,104	$9,310
AFRICA													
British West Africa	$49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	15,636	$26,878	$1,763	.....	3,420	$10,236	780	$539	4,378	$4,801	$4,541	$9,931	$3,916
British East Africa	271	204	.....	.....	.....	.....	.....	.....	.....	.....	.....	328	570
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	180	108	170
Egypt	.....	2,044	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Italian Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Portuguese Africa	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$15,956	$29,137	$1,763	.....	3,420	$10,236	780	$539	4,378	$4,801	$4,721	$10,367	$4,656
GRAND TOTALS	$149,217	$173,398	$60,303	$68,679	47,797	$88,529	126,488	$109,671	309,296	$233,339	$62,592	$227,262	$95,135

United Kingdom Rubber Statistics

Imports

	July, 1922 Pounds	July, 1922 Value	July, 1923 Pounds	July, 1923 Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	17,481	£69,082	64,848	£393,391
Federated Malay States	39,428	175,906	29,016	179,120
British India	6,601	27,736	3,031	19,023
Ceylon and Dependencies	14,179	57,992	17,067	106,220
Other Dutch Possessions in Indian Seas	4,529	19,084	773	4,400
Dutch East Indies (except other Dutch Possessions in Indian Seas)	10,996	44,141	5,496	34,131
Other countries in East Indies and Pacific not elsewhere specified	1,093	4,042	914	5,801
Brazil	2,671	9,925	32	203
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	.....	.....	56	400
West Africa				
French West Africa	.....	.....	285	1,418
Gold Coast	.....	.....	216	828
Other parts of West Africa	515	1,630	139	490
East Africa, including Madagascar	133	420	262	1,513
Other countries	32	118	1,395	8,035
Totals	97,658	£410,076	123,530	£754,973
Waste and reclaimed rubber	469	507	2,254	3,206
Gutta percha and balata	1,416	21,344	2,901	41,572
Rubber substitutes	224	700	.....	.....
Totals, unmanufactured	99,787	£432,627	128,685	£799,751
MANUFACTURED				
Boots and shoes.....*doz. pairs*	8,268	£15,107	8,662	£11,533
Tires and tubes				
Pneumatic				
Outer covers	.....	319,183	.....	188,679
Inner tubes	.....	40,605	.....	35,728
Solid tires	.....	14,875	.....	20,783
Other rubber manufactures	.....	77,474	.....	69,938
Totals manufactured	.....	£467,244	.....	£326,661

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,865	£2,758	5,414	£6,807
Rubber substitutes	447	1,017	3,080	6,648
Totals, unmanufactured	2,312	£3,775	8,494	£13,455
MANUFACTURED				
Boots and shoes....*doz. pairs*	13,356	£23,947	21,398	£30,717
Tires and tubes	.....	.....	.....	.....
Pneumatic	.....	.....	.....	.....
Outer covers	.....	109,950	.....	130,237
Inner tubes	.....	20,073	.....	23,570
Solid tires	.....	22,614	.....	23,734
Other rubber manufactures	.....	208,393	.....	206,488
Totals, manufactured	.....	£384,977	.....	£414,746

Exports—Colonial and Foreign

	July, 1922 Pounds	July, 1922 Value	July, 1923 Pounds	July, 1923 Value
UNMANUFACTURED				
Crude rubber				
To Sweden, Norway and Denmark	513	£1,746	653	£4,199
Germany	12,223	44,380	8,565	54,002
Belgium	1,350	5,081	832	5,223
France	22,856	77,807	22,738	134,643
Spain	343	1,201	152	960
Italy	5,282	17,974	4,570	27,405
Austria	112	324	.....	.....
Other European countries	1,027	3,344	1,472	8,868
United States	13,670	44,950	60,617	418,804
Canada	3,001	10,607	9,528	61,213
Other countries	985	4,595	871	5,885
Totals	61,362	£212,009	109,998	£721,202
Waste and reclaimed rubber	.....	.....	62	94
Gutta percha and balata	469	4,421	508	7,563
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	61,831	£216,430	110,568	£728,859
MANUFACTURED				
Boots and shoes.....*doz. pairs*	347	£1,697	103	£371
Tires and tubes				
Pneumatic				
Outer covers	.....	15,514	.....	13,898
Inner tubes	.....	1,390	.....	3,115
Solid tires	.....	2,270	.....	818
Other rubber manufactures	.....	3,420	.....	2,888
Totals, manufactured	.....	£24,291	.....	£20,990

DENMARK, WHOSE PURCHASES IN 1922 OF OUR ARTIFICIAL leather totaled only $21,250, has already taken during the first seven months only of the present year a total of such goods amounting to $69,424. The July shipment alone was estimated at $31,205.

DURING JUNE AND JULY, 1923, THE PHILIPPINE ISLANDS represent the largest importers of our canvas shoes with rubber soles, taking in the two months respectively 98,947 pairs of such shoes valued at $68,880, and 87,474 pairs valued at $58,416.

ACCORDING TO *Commerce Reports*, THE CONSUMPTION OF CRUDE rubber by tire manufacturers amounted in May, 1923, to 47,671,000 pounds, as compared with 29,068,000 pounds in May, 1922.

United States by Countries During July, 1923—*Continued*

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Other Rubber Manufactures Value
.....	1,860	$31,482	.....	$14,143	.....	2,579	$4,834	.....	$927	$2,199	.....	.....	$1,100	$6,742
$12	12	124	$29	.....	.....	.....	.....	.....	41	.....	.....	.....	.....	404
45	14	272	60	.....	$182	4	9	$22	.....	.....	$26	.....	.....	.....
.....	6,382	86,755	.....	16,702	.....	3,432	9,529	.....	903	1,808	.....	$148	173	4,438
$57	8,268	$118,633	$89	$30,845	$182	6,015	$14,372	$22	$1,871	$4,007	$26	$148	$1,273	$11,584
.....	741	$15,587	.....	.....	.....	910	$2,598	.....	.....	.....	.....	.....	.....	$194
$2,637	1,964	26,414	$89	$427	.....	5,892	8,932	.....	$2,075	$3,381	.....	.....	.....	6,082
.....	219	4,352	.....	.....	.....	230	371	.....	.....	.....	.....	.....	.....	101
.....	211	3,322	.....	.....	.....	185	350	.....	71	.....	.....	.....	.....	1,199
.....	1,567	16,793	.....	187	.....	1,907	2,378	.....	34	.....	.....	.....	.....	465
.....	68	1,081	.....	184	.....	42	84	.....	.....	.....	.....	.....	.....	.....
.....	112	1,153	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	18	.....	.....	.....	4	14	.....	.....	.....	.....	.....	.....	.....
.....	15	163	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	171
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$2,637	4,898	$68,883	$89	$798	.....	9,170	$14,727	.....	$2,180	$3,381	.....	.....	.....	$8,212
$53,418	98,290	$1,097,660	$18,150	$167,797	$15,265	99,569	$168,057	$3,770	$32,635	$55,171	$7,014	$7,946	$27,982	$277,785

Comfiled from statistics supplied by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	June, 1923 Pounds	June, 1923 Value	Three Months Ending June, 1923 Pounds	Three Months Ending June, 1923 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	120,576	$32,751	1,605,974	$546,738
United States	1,747,957	481,992	5,460,358	1,594,753
British East Indies:				
India	.....	.....	.....	.....
Ceylon	.....	.....	.....	.....
Straits Settlements	156,800	41,607	1,913,958	615,081
Dutch East Indies	.....	.....	112,224	30,851
France	.....	.....	.....	.....
Other countries	.....	.....	116,052	27,536
Totals	2,025,333	$556,350	9,208,566	$2,814,959
Rubber recovered	345,808	33,836	811,778	75,379
Rubber, powdered and rubber or gutta percha scrap	277,740	11,055	1,552,431	63,918
Balata	.....	.....	1,120	1,016
Rubber substitutes	41,213	3,613	253,631	33,533
Totals, unmanufactured	2,690,094	$604,854	11,827,526	$2,988,805
PARTLY MANUFACTURED				
Hard rubber sheets and rods	4,223	$3,138	20,342	$9,844
Hard rubber tubes	.....	2,290	.....	6,205
Rubber thread, not covered	8,784	9,581	30,360	34,900
Totals, partly manufactured	13,007	$15,009	50,702	$50,949
MANUFACTURED				
Belting	.....	$13,064	.....	$37,111
Hose	.....	13,043	.....	33,783
Packing	.....	4,502	.....	12,182
Boots and shoes—*pairs*	13,353	25,217	20,417	42,559
Clothing, including waterproofed	.....	19,311	.....	62,501
Gloves	.....	1,696	.....	4,681
Hot water bottles	.....	303	.....	4,594
Tires, solid—*number*	1,982	9,204	4,464	38,502
Tires, pneumatic—*number*	22,972	192,573	36,142	359,034
Inner tubes—*number*	3,149	5,950	12,095	23,142
Elastic round or flat	.....	25,633	.....	84,998
Mats and matting	.....	3,286	.....	6,916
Cement	.....	3,035	.....	14,983
Other rubber manufactures	.....	154,885	.....	461,497
Totals, manufactured	.....	$471,702	.....	$1,186,483
Totals, rubber imports	.....	$1,091,565	.....	$4,226,237

Exports of Domestic and Foreign Rubber Goods

	June, 1923 Produce of Canada Value	June, 1923 Re-exports of Foreign Goods Value	Three Months Ending June, 1923 Produce of Canada Value	Three Months Ending June, 1923 Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$1,274	$16,608	$17,772	$28,542
Totals, unmanufactured	$1,274	$16,608	$17,772	$28,542
MANUFACTURED				
Belting	$23,639	.....	$52,859	.....
Canvas shoes with rubber soles	105,733	.....	272,808	.....
Boots and shoes	28,582	.....	63,521	.....
Clothing, including waterproofed	2,680	.....	5,732	.....
Hose	17,560	.....	28,616	.....
Tires, casings	573,904	.....	1,707,566	.....
Inner tubes	58,437	.....	165,321	.....
Pneumatic	.....	.....	.....	.....
Solid	10,236	.....	21,491	.....
Vehicle	.....	$58	.....	$1,563
Other rubber manufactures	26,129	4,944	54,939	11,193
Totals, manufactured	$846,900	$5,002	$2,372,853	$12,756
Totals, rubber exports	$848,174	$21,610	$2,390,625	$41,298

CARE OF HOSPITAL RUBBER GOODS

Hospitals ordinarily make much use of rubber slip sheets and rubber pillow cases; a hospital having, for example, two hundred beds will require about three hundred rubber slip sheets—"macintoshes," as they are usually designated—and an equal number of rubber pillow cases.

In one hospital an ingenious and economical nurse found it practicable to install a wooden roller, six inches in diameter and long enough to take a slip sheet, with supporting bearings at the ends and a spring locking device; and also short rods each equipped with ordinary flat wire coat hangers with two spring clothespins fixed at the corners.

After these were put up in the locker, nurses were instructed to hang pillow cases by the closed corners on the clothespins, and to wind the slip sheets onto the drum. These two simple devices kept the rubber articles properly stretched, aired, and dry, and climinated the sharp folds in the goods which, under the old method of storing, caused breakdown of the rubber coating in the folds long before the usefulness of the main surface was impaired.

Costs of rubber macintoshes and pillow cases in this hospital for the past two years have averaged but a trifle over one-third their former figures now that the reels and hangers have become standard equipment in all lockers. This should carry a suggestion to all rubber sundries manufacturers.

INDIA RUBBER WORLD
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CAOUTCHOUC
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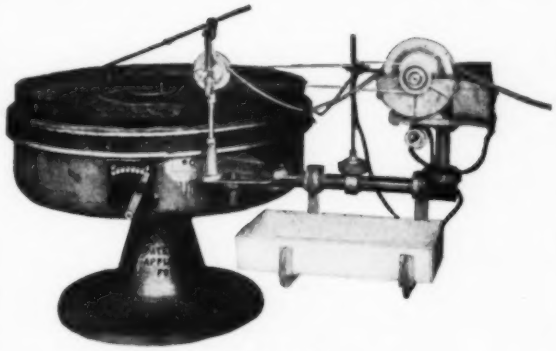
AUTOMATIC MACHINERY



Patent Applied For
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Automatically takes tubing when delivered from the tuber, soapstones the outside and coils tubing in the pan. You can soapstone the inside if desired.

IN OTHER WORDS YOU SAVE A MAN'S WAGES.

HAVE YOU SEEN

THE AUTOMATIC HOSE REEL,
THE AUTOMATIC INSIDE SOAPSTONING DEVICE,
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THE AUTOMATIC TRAVELLING APRON.

Let us send details of these new machines.

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THE VULCANIZED RUBBER CO.

Manufacturers of

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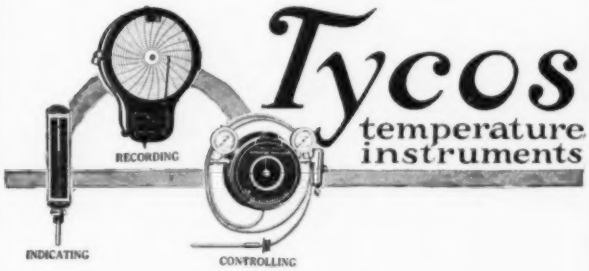

Tycos temperature instruments

WHAT *Tycos* THERMO-TYME REGULATION WILL DO—

***Tycos* Thermo-Tyme Regulator**

1. *For Vulcanizing Fabric Tires:* Raise from cold to final temperature in from 3 to 5 minutes, then hold at this temperature for 1 to 2 hours, the exact time being determined by the chemist in charge, and controlled to within 1 minute.
2. *For Cord Tires:* Adjust the time of the initial temperature rise to from 10 to 20 minutes, and hold for 1 to 2 hours, the exact time being determined as before.
3. *For Solid Tires:* Use the step-cure method over a period of 2 to 5 hours, one particular record of which is shown in Figure 4, the exact times and temperatures again being specified by the chemist in charge.
4. In using a horizontal vulcanizer for tubes, the initial rise takes place in from 10 to 15 minutes, then the temperature is held for 30 minutes to 1 hour, according to specifications, each being controlled to within ½ minute.
5. When using a box type heater for rubber-boots and shoes, the rise covers 6 to 8 hours, then the temperature is held for 1 hour or more, depending again upon specifications.
6. With a pressure type heater for boots and shoes, the rise takes from 2 to 4 hours, and the temperature is then held for 1 hour or more, according to specifications.
7. This device is also being used in a number of specialized applications such as the manufacture of mechanical rubber goods; or in general, wherever a rubber vulcanizing process can be standardized.

Taylor Instrument Companies
Rochester, N.Y., U.S.A. 376
There's a *Tycos* and *Taylor* temperature instrument for every purpose
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Our Publicity Page

Broadcasting Hard Rubber to the Radio World

One of the duties of a trade paper is to take the lead in popularizing the new and worthy products of the industry it treats, and The India Rubber World has always been alive to that duty. When the great wave of interest in radio swept the world somewhat over a year ago, both as a fireside pastime and as a wonderful advance in communications, The India Rubber World was quick to see that rubber, both hard and soft, was to play an important part in its future development.

Our Articles on Rubber in Radio

Realizing the superior merits of hard rubber radio panels and parts, numerous authoritative articles were prepared to popularize their use, to acquaint hard rubber manufacturers with the requirements of the radio trade, and to review the latest methods, molds and machinery for making hard rubber goods from hard rubber dust. Several articles were also devoted to so-called hard rubber substitutes, such as hot and cold molded plastics—shellac or phenolic resin compositions—and to mold making.

Hard Rubber Insulation Now Replacing Phenolic Resin

That our efforts to popularize hard rubber radio parts have been eminently successful has recently become evident in several ways. The article in The India Rubber World of April 1, 1923, entitled "Hard Rubber in Radio Instruments" was reprinted in the August issue of *Q. S. T.*, Hartford, Connecticut, the official organ of The American Radio Relay League. Regarding it, H. F. Mason, one of the editors, writes:

> As a consequence of the article in the August *Q. S. T.*, amateurs throughout the country are fast replacing the familiar phenolic resin insulating materials in their sets with some form of hard rubber insulation, with much success.

Commendation from Hard Rubber Manufacturers

That leading manufacturers of hard rubber goods appreciate and are cooperating in and getting results from this educational publicity campaign is indicated by numerous letters, from three of which we quote briefly.

P. B. L'Hommedieu, of the Hard Rubber Department of the United States Rubber Co., Providence, Rhode Island, writes:—

> The radio people are becoming more and more interested in hard rubber as a suitable material to be used not only for panel work, but in molded work, and the writer believes this is due in great measure to the efforts of your publication, and he feels very well satisfied that all of the hard rubber manufacturers appreciate it.

H. E. Case, of the Luzerne Rubber Co., Trenton, New Jersey, says:—

> We are very glad to see the interest that is being taken in hard rubber for radio insulation. We, of the rubber trade, know its superiority to the other phenol, and are glad to see that the remainder of the country is getting to know more of this material.

Judson Drayton, treasurer of the Vulcanized Rubber Co., New York, N. Y., writes:—

> This matter is of great interest to us, and we shall be glad to cooperate in any way possible. We manufacture a considerable quantity of panels and of ear caps for headsets.

A Bibliography of Recent Hard Rubber Articles

The following articles of interest in this connection have appeared in The India Rubber World:

Rubber in Radio

Rubber in Radio Sets, May 1, 1922.
Radio Equipment and Its Dependence on Rubber, June 1, 1922.
Soft Rubber in Radio Equipment, November 1, 1922.
Hard Rubber in Radio Instruments, April 1, 1923.
The Superiority of Hard Rubber Radio Panels, August 1, 1923.

Manufacture of Hard Rubber

The Manufacture of Hard Rubber Dust, December 1, 1921.
Making Hard Rubber Goods from Hard Rubber Dust, March 1, 1922.
New Developments in Colored Hard Rubber, January 1, 1923.

Mold Making

Hobbing Process of Mold Making, February 1, 1923.
Making Duplicate Molds by Hobbing, June 1, 1923.
Die Casting Rubber Molds, September 1, 1923.

MURRAY RUBBER CO.
TRENTON, N. J. U. S. A.
announcing our new line of
MECHANICAL GOODS
producing the highest grades possible
BELTINGS—Transmission, Conveyor, Elevator.
MOLDED HOSE—Garden, Air, Water.
SUCTION HOSE—Oil, Discharge, Wrecking.
HOSE—Fire, Steam, Water, Pneumatic, Chemical.
DREDGING SLEEVES.